Project “A” – Dry Cured, Fermented, Salami

Project “A” – Dry Cured, Fermented, Salami
6/15/11 – 9/15/11

Project “A” was named for Salame di Alessandra. This sausage is also known as Genoa Salami. In June 2011, nine WD members decided to undertake this 3-month, dry-cured salami project together while keeping accurate notes for comparison and recording their results for the future reference of those yearning to try their hand at making fermented type sausages in the future. The project began on June 15th and ended on September 15th. Participants were required to “sign up” and invest in a certain amount of basic equipment. We fully intended to show our fellow members that quality salami could be crafted without spending a fortune on specialized equipment. Members were asked to make a cabinet for fermenting, purchase a hygrometer and thermometer, cellulose casings, and Bactoferm™ T-SPX starter culture. Members were also asked to read and study a minimal amount of information provided on the homepage by Stan Marianksi. Moderator “Chuckwagon” also provided material to be read by those participating. To be fair to participating members, it was requested that the general public refrain from writing in “Project A” after June 15th.

The project was not intended for beginners in the hobby. Crafting dry-cured, fermented, salami requires prior experience in grinding, mixing, stuffing, and other skills honed by good old-fashioned trial and error in making basic sausages such as fresh cased links, cured-smoked-cooked links, and others.

Some of the member’s projects succeeded, others did not. All the members succeeded in providing much information to those who will attempt making dry-cured sausages in the future. All participants should be congratulated for some very fine work and great ingenuity. All indeed succeeded as their information will ultimately be of great value to those just starting out.

Project A is a very valuable learning resource to those trying their hand at it for the first time. As a learner reads through the information, he may simply avoid the mistakes, oversights, and errors made by these pioneers. There is much technical information recorded, along with photos and remarks. Congratulations to the participants are in order. Thank you gentlemen. Your posted information will help others for a long time to come.

My Very Best Wishes,
Chuckwagon

Hello smoke addicts!

I’ve had an idea in mind for some time and would like to have your opinions. Why not make a dry-cured salami TOGETHER? I believe that many of you good folks are hesitating to make the
plunge into “fermented type sausage” for several different reasons. I’ve included a few possible “rationalizations” below. Let’s see if you recognize any of them.

I am proposing that we open a forum topic solely for the purpose of making a batch of dry-cured salami together – with everyone starting at the same point with the same ‘lack’ of equipment, and limited bucks. We’ll take it step-by-step, allowing everyone a few days to view this message and ponder it over. Then there will have to be some time allowed to order Bactoferm and a hygrometer ($14.95) from your supplier. While you’re waiting for the mailman, you could shop for some great beef chuck and some luscious pork butts. We can share information as we go along and discuss each member’s plans for fermenting and curing and then for storing. We’ll have much to talk about and discuss, and no doubt the forum will be fairly active – but shucks, that’s what we really want… lots of participation and input as we go along. We’ll act as a group and do everything together at the same time. For instance, we will all grind the same day and all of us will stuff casings the same day etc. We could exchange ideas and share thoughts until at last, we each have made a properly air-dried salami.

Today at lunch, I sliced off a thick slice of salami and put it on a sandwich. I had just “pulled” it from the storage chamber and found myself thinking, “This is the best salami I’ve ever tasted”… “Why aren’t the folks on the WD Board tasting this quality sausage every single day?” Bragging? Naw! Is Ol’ Chuckwagon just makin’ noise because he ‘knows how’? Nope! That’s not it at all. Shucks, it is simply that I bothered to make my own “quality” air-dried product rather than settling for the mass-produced and hurried-along crap they put in the grocery stores these days, made with inferior ingredients. And you can do it too! Heck, why not use real paprika instead of flavoring oil, and real ingredients rather than flavored chemicals? And for goodness sakes, REAL Boston butt and choice fatback.

OK, have I got your interest and attention? Would anyone out there be willing to participate in this experiment with ALL OF US making a dry-cured salami at the same time? Think of the advantages:

1. You’ll learn how to make dry-cured salami – at last!
2. It will bring several of us much closer together.
3. It will be fun.
4. It will be a motivational step you may never have again to finally get around to makin’ the stuff!

OK, Here are a few reasons to talk yourself right out of it! Some of that reasoning might include:

1. I’m afraid it requires too much “specialized knowledge”. I might have to read and study a little. And, isn’t there a ton of stuff to memorize?
2. I’m afraid it will fail and I cannot justify the expense if it does fail.
3. It’s expensive and requires too much specialized equipment.
4. It takes too long to cure.
5. I’m too old to learn how to do it, and if I fail, my wife will say, “See, I told you so”.
6. I don’t have the time to make fermented sausage.
7. The process is too tedious.
8. I hate mold. After all, won’t that stuff kill ya?

On the ranch, we have a saying for every single one of the excuses listed. It’s only one word but it sums it up. The word is “bullsnot”! Uh... sort of! If you think you are too old, or it takes too much time, or think you will fail... all I can say is “bulls**t”. If you think is requires a little special knowledge, you’re right. But hours of study? Nope... hey, this isn’t rocket science! Memorize stuff? Nope. You don’t have time? Again, all I can say is “bulls**t”. And I’m sorry that you will never be able to taste the exquisite flavor of genuine, hand-crafted salami – something many of you will never have the opportunity of trying.

If we decide to make this **project** work, then get ready to experience an entirely new taste in meat flavor. In my opinion, it will absolutely be worth the effort and the time. There’s just no reason why you shouldn’t be able to experience success in making air-dried sausages, especially now that we have Bactoferm™ bio-cultures on the market.

How about expressing your opinions here? Also, let me know if you’d like to take part in this project.

Best Wishes,

Chuckwagon

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Ok. I am willing. Is a five pound batch reasonable size? I only have 30 mm casing do I need larger? I have time, even though as I mentioned it is summer here. I will never be too old to learn something new. So that takes care of the rest of the member excuses concerning age. I have a refrigerator that is used for overflow food storage and I can adjust the thermostat for most any temperature. It is frost free so the humidity is always very low. My house is airconditioned and kept below 80 degrees F.

What am I lacking?

By the way I think that you have a good plan.

Ross

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Ross- tightwad home cook

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Chuckwagon, I am a craftsman and I make things work. My Dad taught me that a poor workman blames his tools for poor results. but a skilled craftsman can produce good results with the tools at hand. I have told you what I have for tools, mostly, I have a torsion balance that can resolve .01 milligram. So I can measure very small quantities of almost anything. I know how to dilute a
milligram in a litre of water and use 5 cc's. please teach me how to use the tools that I have to
make good sausage. I read well and have taught myself many skills from books.
Thanks,

Ross

Chuckwagon

Posted: Thu Jun 09, 2011 09:27

Hi Ross,

You wrote:

Quote:

I have a refrigerator that is used for overflow food storage and I can adjust the thermostat
for most any temperature. It is frost free so the humidity is always very low. My house is
airconditioned and kept below 80 degrees F. What am I lacking?

Ross, your refrigerator might not work for a curing chamber as it may need to be kept warmer
than the controls are designed to keep it. Also, we need to raise the relative humidity rather than
keep it low. You would have to disconnect the frost-free mechanism. How about reading the
material found at this link: http://wedlinydomowe.pl/en/viewtopic.php?t=4880

As you are a craftsman, you may wish to build a box of plywood and line it with thick-gauge
plastic sheeting. You may possibly be able to place a pan of salt and water in the bottom to
produce enough humidity to support fermentation. It will be necessary to also heat the box
slightly, using some type of heater - perhaps a slow-cooker heating unit or an aquarium heater.
We’ll cross that bridge in a few days. Can you give me an idea how much relative humidity you
have where you live?

Ok, we’ll do it. I just got an email from another member (Rand) and he wants to join the venture
project. I’d like to wait just a couple of days and see if some other folks might want to take part
in the venture also. Let me see if I can intimidate a couple of more prospective salami makers.

Best Wishes,
Chuckwagon

jbk101

Posted: Thu Jun 09, 2011 09:42

Hey Chuckwagon,

I am also willing! But I do have a couple of worries. As you know I am a rookie willing to try
and learn but like to have my ducks in a row before I start shooting them down.

I like your idea alot and also like the idea of a mimimal investment to start out with so here are
some of my concerns.
What basic equipment is needed? I don’t have a good area to cure in so what alternatives could you suggest. I have seen where an old ice box is converted into a humidity cabinet are there other alternatives? If so what’s you thoughts on them?

If you could give a basic run down of the required equipment and the process in general it might be helpful and even motivate a few to join in 😊

Chuckwagon

Hey, hey John!
I know most everyone has the same concern over rushing right out and purchasing a bunch of equipment. In this economy… forget it! But there’s always more than one way to skin a cat.
Actually, the only real expense would be a hygrometer ($14.95), a reliable thermometer, a used computer fan, possibly the expense of an old cabinet of some type, and some plastic sheeting to line it with. The cabinet doesn’t have to be very large. These days, office equipment stores even have plastic storage boxes at very reasonable prices. Bactoferm T-SPX has gone up just like everything else and although it is $16.99 for a 25-gram packet, it will cure 400 pounds of meat! We’ll probably start with ten pounds of salami so you’ll have to freeze the remainder (it has a shelf life of 6 months when frozen). That will give you a half-year to make 390 more pounds of pepperoni and salami! Bactoferm “Mold-600” is $19.99 for a 25-gram packet and will give you enough penicillium nalgiovense to cover the statue of liberty a few times with white, flaky, mold. The remainder may be frozen up to six months also. We will need a few 3” synthetic fibrous casings and the mahogany-colored ones come in bundles of 20 and are 2 feet long. Each casing will hold 5 pounds of meat, so you’ll have 18 casings left over for the next bunch of bewildering, belated, batches. The bundle of 20 costs 15.99.

Our fellow member “Rand” said he picked up a hygrometer at a hardware store for only about six bucks. If you find one locally, you may want to start checking out the relative humidity in your basement or another damp area of about 80% for the 2 to 3 month drying period. Your “curing chamber” will have to be about 90% humidity for 72 hours at about 68˚F (20˚C.). We’ll drop the temperature for the 2-3 month drying period by ten degrees, down to about 58˚F (14˚C.). Does all this sound feasible to you?

Best Wishes,
Chuckwagon

ssorlih

This would be a better project for the fall season. Right now we have temperatures in the 90's and dew points above 70. I have a thermometer hung near an A/C outlet and it reads 75 degrees.

I can get foil faced urethane insulation boards 1 1/2 inches thick and 4x8 feet. That could make a 16 x24 inch cabinet 4 feet tall with lid and floor. It can be "nailed" with long dowels sharpened in a pencil sharpener. That cost would be about 25 dollars. The housing on a crock-pot has a
small heater in it that would be plenty for the times when we need to heat. I could probably figure out a way to duct chilled air from my refrigerator. Do you remember the swamp air chillers that were used in the west before mechanical A/C? Florists use a soft porous foam for supporting flower stems. This foam would provide a large surface area for evaporation for humidity control in the chamber.

I presume that adding salt is to prevent a biology demonstration in the swamp.

Ok. If I convert this from obstacles to challenges and apply myself diligently I think that I can make it work. Some of the crock-pots have digital temperature controls that could be used for the chamber.

Ross- tightwad home cook

Challenge Number one: control the temperature in the cooling chamber. Solution go low tech. My refrigerator can make about 100 pounds of ice per week. Humidity water pan in bottom of chamber can be an open ice chest. I routinely freeze water for the ice box on my boat so I can just as easily make ice for the curing chamber. 20 ounce soda bottles are convenient sizes as are 2 litre bottles. Five pounds of ice per day keeps my ice box cold on the boat so a pound per day will probably keep the chamber at 58 degrees. The heater from a crock-pot can supply all the heat I need.

Ross- tightwad home cook

Okay, I'll try to be in. I share the same concerns as the others though...I don't think I am equipped to do this right.

Teach me master

Dave

Long before there were refrigerators there were ice houses and men cutting ice on lake in the winter time. Before we had electronic hygrometers there was wet bulb, dry bulb systems to determine relative humidity. I believe that if we put our collective minds to work on this we can make this affordable for everyone. We just have to use our heads more and our wallets less.
The advantage that I see in making a curing chamber with foilfaced foam insulation is that we can pull the pins and store it flat if we choose to put it away. Knocked down it would be just 2 feet wide 4 feet long and slightly less than 8 inches thick.

Ross- tightwad home cook

uwwanna61  
Posted: Fri Jun 10, 2011 02:19

Bullsnot I'm in! I have a working fridge set up as an incubator, with temp controller and a humidifier with controller. This is right up my alley I have the recourses just need the experience \practice! The cracked pepper salami sounds interesting.. 😊

charcutebrew  
Posted: Fri Jun 10, 2011 06:19

Ross, I've been thinkin' the same about the foil foam board. Meant to pick some up last weekend but got sidetracked by another project. For warming up, a lightbulb can do the trick handily. For a large converted cooler a 7.5 watt bulb seemed to do the trick, for what it's worth. I was trying to think of a good way to get a small quantity of ice in the chamber, I like the idea of a 20-oz bottle of ice or something...

Just spitting without censoring right now, it seems like you could rig up a little computer fan, maybe baffle it a little so it didn't blow directly into the chamber... & even run a bit of ductwork to that inlet so you could use the chamber as a cold-smoke chamber? Though maybe the smoke smell would be too intense for non-smoked meats later?

Chuckwagon  
Posted: Fri Jun 10, 2011 06:57

OK Sausage makin’ Dudes! Let’s go for it. As we say out here… Yeeee Hawww! 😊 And Ross, half the people in the west, still use a “swamp cooler” for air conditioning. It really raises cain with their piano tuning, but puts that moisturized glow back into delicate facial skin – so vitally important to those grizzly cowboys and other meadow-muffin kickers out here. 😄

Shucks pards, I’m glad to see you folks joinin’ us for the “project” – We really shouldn’t call it an experiment though. How about we call this thing, “The A – Project” (for Alessandra – meaning “Genoa” type salami). Geeeze, “Alessandra” sounds sooo much more sophisticated than just plain ol’ “Genoa” salami – although it is exactly the same stuff! Here’s what I’m proposing:

**Salami di Alessanddra by Stan Marianski**

2.0 kg (4.4 lbs.) pork butt
2.0 kg (4.4 lbs.) beef chuck
1.0 kg (2.2 lbs.) pork back fat (or fat trimmings)
140 g. salt (3%)  
12 g. cure #2 (do not use cure #1 in this recipe)  
10 g. powdered dextrose (glucose)  
15 g. sugar (3%)  
15 g. white pepper  
0.6 g. (1/4 tspn.) Bactoferm™ T-SPX  
----- Bactoferm™ Mold 600  

Optional: Note: To make 5 kg. sausage, about 7 g. of spices and 4 g. of herbs are needed.

120 ml. (1/2 cup) quality red burgundy or other dry red wine (Do not exceed ½ cup).  
4 parts coriander (spice)  
3 parts mace (spice)  
2 parts allspice (spice)  
1 part fennel (spice)  
3 parts marjoram (herb)  
1 part thyme (herb)  
1 part basil (herb)  

Instructions:  

Preliminary steps: Keep a logbook! Record everything you do. Write down dates, times, measurements, etc. Believe me, you’ll refer back to it several times during the process. Save your notes for the next batch. They will be invaluable. Don’t ignore this step. It only takes a few seconds to write down the information you may really need later on.  
Thaw the Bactoferm™ T-SPX following the directions on the package. Measure .6 gram (1/4 teaspoon) of the culture and mix it with a little distilled water, allowing the bacteria to “wake up”. Freeze the back fat and nearly-freeze the lean meat. Freeze the grinder plate and blade (20 minutes is plenty). Cut the meat and fat into cubes.  
1. Grind the pork and back fat through a 3/8” plate (10 mm). Work in small batches and refrigerate the meat and fat at every opportunity. Grind the beef using a 3/8” plate then again using a 1/8” plate.  
2. Mix all the ingredients with the ground meat and develop the primary bind. Fold in the fat particles.  
3. Stuff the mixture firmly into beef middles or 46-60 mm. protein-lined fibrous casings, making links about 16 to 20 inches long. (Protein-lined fibrous casings shrink with the salami as the sausage dries.)  
4. Weigh each salami and record its “green weight”. Keep a log book!  
5. Ferment at 68˚ F. (20˚ C.) for 72 hours, in 85% to 90% humidity.  
6. Hang the salamis in the drying chamber and mix the Mold 600 according to the directions on the package. Spray the sausages with a misting sprayer or dip them into a solution. Dry the salamis at 57˚ F. (14˚ C.) in 80-85% humidity for 2 to 3 months (until 30-35% weight loss is achieved).  
7. The salamis are stored at (+or- 4˚) 55˚ F. (13˚ C.) in 75% humidity.
OK salami makin’ hombres! This is YOUR party, so we don’t have to make this particular salami if you have another recipe in mind. I’m just makin’ a suggestion. I like this one because it will give you experience with most aspects of the craft. How do you folks feel about this recipe?

Best Wishes,
Chuckwagon

PS. So far we have:

Rand
ssorliih
JBK
DaveZac
uwanna61

carcutebrew... are you in?

Anyone else want to become part of the action? Pretty soon we’ll have to order supplies. While we’re waiting on them, some of you will be making your curing chambers. It's not too late to sign up. The reason I'd like to see folks "sign up" is because once we start the project and get lots of dialogue going, I don't think it would be fair to those participating to have unsolicited remarks made from those choosing not to participate. What do you folks think about this?

ssorliih  
Posted: Fri Jun 10, 2011 14:11

I will pick up a sheet of foam board today and a couple of digital instant thermometers(wet bulb/dry bulb) I have several computer fans including one used just for cooling the main processor it is about 2 inches square. If I put a small light on a dimmer switch I can controll the heat. I guess hanging the bottle of ice from the same sticks as the sausage would be convenient. Do you think that 4 feet tall is too much? Would 3 Feet be a better choice considering top access? Making it 3 feet tall would allow me to make it 2 feet square. Almost 12 cu.ft. Very light weight and easily moved when not in use.

Ross- tightwad home cook

uwanna61  
Posted: Fri Jun 10, 2011 22:05

Butcher Packer order complete today just need some beef chuck, already have the pork and fat. Do we have a start date?:

ssorliih  
Posted: Fri Jun 10, 2011 23:18
I can't find a source for dextrose locally but I can find glucose (AKA Karo syrup). What is the conversion factor?

Edit to add: Adding bottled ice will remove moisture from the air by way of condensation. If I wrap the bottle of ice in wet burlap will that solve that concern? I ordered casings and culture from Butcher and Packer.

Ross- tightwad home cook

NorCal Kid

Posted: Sat Jun 11, 2011 01:28

This sounds like a great project & I do want to eventually make my own dry cured salami. However, I think I'll take a seat in the bleachers and watch this play out, notebook in hand. I've already exceeded my sausage budget both monetarily and time-wise for this month. Just ordered an new smoker too...

Good luck everybody. I look forward to seeing the progress!

-kevin

Chuckwagon

Posted: Sat Jun 11, 2011 01:55

Ross, Karo corn syrup also contains fructose, water, additional salt (we don't know how much), and vanilla. No vanilla in my sausage please. May I suggest you order a little powdered dextrose when you send for your Bactoferm? Some recipes call for corn syrup solids, but this isn't one of them. Powdered dextrose is ideal and not all that expensive. We can get a couple of pounds of the stuff for $7.99 and have plenty left over for your next salami.

Best Wishes, Chuckwagon

ssorlilh

Posted: Sat Jun 11, 2011 02:01

Ok. New question How critical is casing size? 2.55 OK?

Ross- tightwad home cook

Chuckwagon

Posted: Sat Jun 11, 2011 07:42

Are they protein lined? Dry-cured sausages are ideally cured in synthetic fibrous, protein-lined casings that shrink as the salami loses moisture. Of course you can stuff other types as they have done for centuries, but
for convenience and optimum appearance, protein-lined synthetic fibrous are hard to beat. The fiber in them runs lengthwise and makes the casing so strong you can beat the stuffing in with a hammer if you so desire. If we make ten pounds of the stuff, you may wish to give one away to your best friend when you find out how good it is going to taste. In that case, it would be nice to have a really nice looking product to present to someone else. They even make them in models that look like braided string and one that even looks like white textured mold (in case you wish to smoke them and don't develop mold on it). Shucks, you can even buy them with Santa and his reindeer on them for Christmas presents.

Maz Posted: Sat Jun 11, 2011 08:57

Hi Chuck,
I have been wanting to try my hand at salami for a long time unfortunately right now I am over my head at work so have very little time for any thing. But i think it is a brilliant idea and will follow, if I do get a chance will bail in at some point.

SikaStag Posted: Sat Jun 11, 2011 10:02

What a great idea Chuckwagon.

I would love to get involved in doing this.
I was thinking of getting a Bottle fridge like you would see in Bars. I have seen this type fridge used by others fermenting sausages.
I will have a read up on what else I require to get a system ready to start making Salami's.
I will follow this post with great interest.
I would like to make venison Salami, unfortunately this is not the season for Sika deer, they will be calving in the next few weeks, The Stags come into season on the 1st of July, A young pricket would be an ideal candidate.

Good luck to all that are having a go.

ssorlih Posted: Sat Jun 11, 2011 14:31

The casing that I ordered is called mahogany fibrous summer sausage casing. 2.56x24inches will hold 2.5 pounds. This would allow 4 pieces when stuffed. Ordered from Butchers and Packers.

Ross- tightwad home cook

Dave Zac Posted: Sat Jun 11, 2011 16:20

Okay, Bactoferm t-spx and Bactoferm mold 600, mahogany fibrous casings, and dextrose ordered from sausagemaker.com.
Looking back, the mahogany casing (15.99) is not protein lined. Big deal? I'm trying to work with them to change order for a protein lined casing. Sorry to say I have had some trouble with them in order changes in the past.

Otherwise I think I have a cabinet I can retrofit to work. I think I'm close to being in business.

Dave Zac

ssorlli

Posted: Sat Jun 11, 2011 17:01

I guess that we will find out in a few months.

Ross- tightwad home cook

charcutebrew

Posted: Sat Jun 11, 2011 17:19

Chuckwagon, great idea. It'd be a fun project... I don't think I can swing the money right now, though. In addition to ingredients I resolved not to use that hand-crank grinder/stuffer again, so I need to build or buy another. If I can get everything in by the time you guys start, great, & if not I'll follow along with interest.

ssorlli

Posted: Sat Jun 11, 2011 18:36

As with all the tools I buy I work my way up the scale of sophistication as my needs and use dictate. I morticed many hinges into doors and door jambs with a hammer and a sharp chisel before I spent 400 dollars for the fixtures that allow me to use a router and do a better and faster job. But that is the way I earn a living.
I am going to have about 100 dollars invested in this summer sausage effort which will bring the cost up to about 13 dollars per pound. That is just a bit more than market for some of the better locally made sausage. The more successful batches that I make and eat the sooner I amortize the cost. One hundred pounds would bring the equipment and speciality products cost down to a dollar per pound over the cost of the meat. Even if it take ten years to do it the return on the investment is good.

Ross- tightwad home cook

ssorlli

Posted: Sat Jun 11, 2011 20:41

Found and ordered some 2.375 x 24 inch protein lined casing. I can use the other for some other purpose.
Ross- tightwad home cook

ssorliih

Posted: Sun Jun 12, 2011 05:58

Now that I have a supply of fibrous casing on order that is not suitable for dried sausage I will use some of it to make ham sausage from the "BOOK" but using a turkey that I bought today for .69 per pound. Grind some, cut some into chunks and stuff into the casings and proceed as for ham sausage. I will process the whole bird, teeth, hair and eyeballs. 😄

Ross- tightwad home cook

Chuckwagon

Posted: Sun Jun 12, 2011 10:33

Hi Guys,
Is the Salami Alessandra recipe ok with everyone? If so, maybe we should think about ordering our supplies on Monday and close the “sign up” sheet on Monday evening. I sent some emails to several members who won’t get them until they go to work on Monday. Let’s give them a chance to respond on Monday.

After that, while we’re waiting on the postman, allow me to present some written stuff for you to review. After that, I’d like to open up a discussion for the questions that arise concerning temperature, humidity, fermentation, curing, etc., and just a bit about bacteria and what they do. I’ll outline exactly what we will be doing and then later in the week, we should start thinking about our fermentation chambers. (Although I’ve got blinking neon, hot-stuff, iron-clad, glow-in-the-dark, professional equipment, I’m going to build one right along with you). Right now, we’d probably better consider our expenses and the items we’ll be needing. Some of you have ordered already, and that is just fine – you’ll have the jump on the project by a few days.

It looks as though we will have the following sausage wranglers participating: (in alphabetical order)

1. Rand Iowa
2. ssorliih Maryland
3. JBK Indiana
4. DaveZac New York
5. uwanna61 Vermont
6. SikaStag Scotland
7. Gray Goat Illinois
8. Party Cook Wisconsin
9. Chuckwagon Utah

Let's start thinking about ordering or rounding up the following items:
Casings 3” x 24”.................$15.99 for 20 protein-lined fibrous type

Bactoferm Mold-600................$19.99 for 25 gr.

We will need a few 3” synthetic fibrous casings and you don’t have to have protein-lined type, but they are certainly more presentable as they shrink with the sausage as it dries. They available at no additional price and come in bundles of 20 and are 2 feet long. Each casing will hold 5 pounds of meat, so you’ll have 18 casings left over for the next bunch of bewildering, batches. The bundle of 20 costs 15.99.

Your “curing chamber” will have to be about 90% humidity for 72 hours at about 68˚ F. (20˚ C.). We’ll drop the temperature by ten degrees for the 2-3 month drying period, down to about 58˚ F. (14˚ C.) while we reduce the humidity to about 80% for the 2 to 3 month drying period following the fermentation period.

Hey pards, I just thought of something. This has just got to be the world’s most unique and “spread out” batch of salami ever made! 😊Shucks pards, we just might be makin' history! I can see us all on the News At Ten!

Best Wishes,
Chuckwagon

P.S. Ross, either casing you prefer will work out. The 2-3/8” will just finish a little faster than the rest. And shucks, back when I was making these things with the cavemen at the Alamo, during the War of 1812, we didn't have any protein-lined fancy stuff either. 😈
hi all , i wold be very interested to but unfortunatelly right now i cant do . am getting divorced and all my equipment is at the house an i am not there anykore till this thing gets sorted out so sorry, i think it is a very good ideea do

Chuckwagon, How close to airtight should I make this chamber. If I peek in once a day is that enough ventilation?

Ross- tightwad home cook

I think I'm on my way. I used an old TV stand with cabinet underneath. Tore out the shelf, put on a new back and new doors to fit the space.

The chamber is 24" high, 22" wide, and 15" deep. Still need to wrap inside with plastic and mount computer fan in back. Best part is, this cost me $0. Just about 2-3 hours of my time this morning. I think I have plastic around here somewhere, and a fan at work.

Any other suggestions?
Just slather on a coat of epoxy resin. Or even polyester resin but my first choice would be epoxy. It is practically completely waterproof.

Ross- tightwad home cook

Hey Siggi, We’re sorry to learn of the divorce in your life. Will you watch for my email? You’ve got pals here toolman, and we’re all hoping you quickly get back on your feet with any problems behind you. Stay in touch please.

I also heard from our ol’ friend Gray Goat. He has been unable to log on to our site for some time but we didn’t know about it until this evening. We’ll save a spot on the Project-A for you Wayne. We might have to have you re-register with a slight variation in your handle.

ssorllih, you don’t have to make it completely air-tight, but it should keep out a stiff nor’easter! When we get underway, you’ll understand why you want to have complete control over how much air exchange (called air speed) you’ll have to have. For right now, just make sure it is fairly tightly closed up.

DaveZac, you’ve outdone yourself. That’s incredible! And you can’t beat the price eh? Now, you may wish to glue in or screw in a couple of notched furring strips along the top inside to hold a few hardwood dowels or rods – whatever you can scrape up. For your smokesticks, be sure not to use a treated-wood or a broom handle or anything like that. New, clean, wooden dowels would be ideal. Or clean steel rods.

Wow, Dave. That’s a first-class job sir! Just like all your other projects my friend.

P.S. Ross is right about the epoxy. Lots of folks have even used stainless sheet metal or even acrylic paints as well as the new epoxy paints used by folks who make aquariums at home. With
the paint, you'll have to "break it in" a bit to eliminate odors. I like the idea of sheet plastic for easy removal of mold later on. With my "pro" model, I have to scrub out the old mold every time I make a new batch of sausage. I'm wondering if somehow you could "peel off" a layer of plastic sheeting and just throw the mold away.

OK folks, almost time to get underway. By the way, do you know where the cowboys’ phrase “Yee Haww” came from? When you drive a team of horses pulling a wagon or stagecoach, you yell out “Gee” to have them turn right. “Haw” gets them to turn left. Shucks, I’ve always wondered if you yelled out “gee” and “haw” at the same time while they were crossin’ a creek, would they turn “starboard” or “port”? 😁

Best Wishes,
Chuckwagon

==================================and the project begins==================================

Chuckwagon  🧐
Posted: Mon Jun 13, 2011 13:11

Hi Everyone,
Here we go… Yeeeee Haaaww!

1. Equipment:

Let’s start out by reading some basic information by Seminole (Stan Marianski) that he has graciously shared with us. Some of it gets a little involved but it is great info. Most of us won’t be ordering the electronic controls quite yet, but it won’t hurt to glance through the material and know it’s there for later reference. Other information near the end of this article is very much worth studying a bit. Here’s the link:
http://www.wedlinydomowe....usage/equipment

Most of us will use a simple curing box with humidity boosted by salt spread out on a lipped cooking sheet. We’ll put in just enough water to cover the salt and take reading of the relative humidity at several different intervals before we even put the salami inside. Remember to jot down any questions in your notebook as you read the article. How about hashin' it over Monday evening?

Next, in a few days, let's go to:

2. Fermenting Sausage:

Here’s some basic material that Seminole (Stan Marianski) has written about fermented sausages. Read it again if necessary, to grasp as much as you can. When questions arise… jot them down in your notebook and post them here so everyone can benefit from our dialogue. This
is the very basic information you’ll need to understand what’s happening inside that gorgeous curing chamber you’ve been building. Click on this link:
http://www.wedlinydomowe....rmented-sausage

Best Wishes,
Chuckwagon

ssorllih  ⏱
Posted: Mon Jun 13, 2011 13:33

There is a food wrap product called ‘press and seal” that is slightly adhesive on one side. That might be just the thing for a peelable chamber lining.

Ross- tightwad home cook

Dave Zac  🌐
Posted: Tue Jun 14, 2011 03:12

Chuckwagon wrote:
DaveZac, you’ve outdone yourself. That’s incredible! And you can’t beat the price eh? Now, you may wish to glue in or screw in a couple of notched furring strips along the top inside to hold a few hardwood dowels or rods – whatever you can scrape up. For your smokesticks, be sure not to use a treated-wood or a broom handle or anything like that. New, clean, wooden dowels would be ideal. Or clean steel rods.
Wow, Dave. That’s a first-class job sir! Just like all your other projects my friend.

Done. Screwed in two notched furring strips as suggested. I was going to use hooks to hang salami from. Your suggestion made me think straight. Hardwood dowels will be better for my Kabonasy to hang from too. I really like the press-n-seal idea too. Gonna try that.

Dave

ssorllih  🌐
Posted: Tue Jun 14, 2011 04:13

A little cart before the horse here but as we are planning a 30 percent weight reduction(?) in the finished sausage I presume that it is prudent to weigh and label each link at the start. This would indicate the need for a scale somewhat more accurate than the bathroom scale. Smoked sausage is often shown hanging two links middled and touching a little while in the smoke. It is better that these planned links don't touch one another. Yes? Even better that they not be crowded but have plenty of elbow room even though they lack elbows?

Ross- tightwad home cook
partycook  🌐
Posted: Tue Jun 14, 2011 04:32
Hi Chuckwagon

I don't know if you have received my reply. (no way to tell if my answer has been sent)

Let's make dry cured salami together

yes I would like to join you in doing this.

John

Chuckwagon  
Posted: Tue Jun 14, 2011 05:08

Hey Partycook,

Good to have you aboard. Are you ready to make some great salami?
Did you send another note? Perhaps an email? Telegraph? Pony Express Rider?
We didn't receive any other note - just in case you need to check your computer.

OK partycook, remember to check out the topic "Project A" each day. Right now it's in Hyde Park (chat) but we'll be moving it soon to a more appropriate forum. Glad you're with us Partycook!

Best Wishes,
Chuckwagon

Chuckwagon  
Posted: Tue Jun 14, 2011 09:43

Hi Sausagemakers, Our "Project A" participants include:

1. Rand....... Iowa
2. ssorllih....... Maryland
3. JBK....... Indiana
4. DaveZac....... New York
5. uwanna61....... Vermont
6. SikaStag....... Scotland
7. Gray Goat....... Illinois
8. Party Cook....... Wisconsin
9. Chuckwagon....... Utah

We should outline our intentions and make the project a little more clear for those having questions remaining. Project “Allysandra” is a way to make Genoa type salami (Allysandra) on a shoestring. As most of us are on a budget, it’s difficult to lay out several hundred bucks for first class equipment – especially in this economy. I’m suggesting that you can cut a few corners and still enjoy making some great tasting dry-cured salami. We’ll have to make our own cabinets or find an old refrigerator. (See “equipment” below). We’ll have to do without electronic controls but we can get around them although it is not as convenient as having automatic regulators. Later on, we’ll add moisture by placing a bed of salt in a lipped pan and barely
covering it with water. We’ll have to monitor the humidity so a hygrometer will have to be purchased along with a thermometer.

OK everyone, we should have ordered our supplies today (Monday) or by Tuesday noon at the latest (6/14/11). Order Bactoferm T-SPX, and Mold-600. Make sure you have some casings (see the dialogue above for the type), a hygrometer and a thermometer. You might also need some hog rings if you use them. Please let us know when you receive them.

Again, while we’re waiting, let’s study a bit! During the next couple of days, I’d like to have you read some material. Let’s take the following items in sections. Please read numbers one and two by Thursday or Friday. Jot down notes in your notebook. Also, write down any questions you’d like to ask on the forum. I’d like to post some questions for you to consider while you read. If you’d prefer, you could read the material, then answer them to let yourself know how you are doing in understanding the material.

No one expects you to go deep into the theory of fermentation or delve way down into the issue of bacteria. But I think you’ll agree, you should at least know a few basics and read a bit about just what in the heck we are doing! Although our own health and safety are vitally important, the health and safety of other people who are consuming our hand-crafted product, becomes paramount! You surely wouldn’t want to injure anyone, so please read and understand the basics. And for goodness sakes… don’t be afraid to ask questions. There are no silly questions, and by asking a simple question, you don’t have to feel embarrassed in any way.

### 1. Equipment:
Let’s start out by reading some basic information by Seminole (Stan Marianski) that he has graciously shared with us. Some of it gets a little involved but it is great info. Most of us won’t be ordering the electronic controls quite yet, but it won’t hurt to glance through the material and know it’s there for later reference. Other information near the end of this article is very much worth studying a bit. Here’s the link:
[http://www.wedlinydomowe....usage/equipment](http://www.wedlinydomowe....usage/equipment)

### 2. Fermenting Sausage:
Here’s some basic material that Seminole (Stan Marianski) has written about fermented sausages. Read it again if necessary, to grasp as much as you can. When questions arise… jot them down in your notebook and post them here so everyone can benefit from our dialogue. This is the very basic information you’ll need to understand what’s happening inside that gorgeous curing chamber you’ve been building. Click on this link:
[http://www.wedlinydomowe....rmented-sausage](http://www.wedlinydomowe....rmented-sausage)

**After a few more days, we’ll move on to these topics, one at a time:**

### 3. Cultures:
Let’s click on another link and talk about bio-cultures. Again, Stan has shared much information with us. It’s important to know what Bactoferm is doing inside our salamis. Here’s the link for understanding cultures:
[http://www.wedlinydomowe....ausage/cultures](http://www.wedlinydomowe....ausage/cultures)
4. Safety Hurdles:
This article addresses the information we need to know so we don’t poison ourselves! It is most interesting and sure to bring up lots of questions. Click on this link:
http://www.wedlinydomowe..../safety-hurdles
It would also be beneficial to review the FSIS regulations regarding the calculation of nitrates and nitrites in meat products. Their handbook is available to us in its entirety at this link:

5. Standards:
Here are the definitions and the rules that go along with this type of sausage making. Click on this link:
http://www.wedlinydomowe....usage/standards

6. Traditional:
Traditionally made fermented sausages are made without starter cultures or sugar and rely entirely on bacteria present in meat and in the surrounding microflora. Interesting reading. Click on this link:
http://www.wedlinydomowe....age/traditional

Best Wishes,
Chuckwagon

Chuckwagon
Posted: Tue Jun 14, 2011 11:48

Hi Ross,
Yes, we’ll weigh and number each sausage as we initially place it into the CC. I use little cardboard tags with strings to tie to the end of each sausage, then use a PENCIL to record the “green” weight of each one. (Ink will run and smudge in a high-humidity chamber).
It’s also a good idea to record their weight in your notebook along with the date it went in and the humidity of the chamber at the beginning of the process. And yes Ross, a bathroom scale won’t do it. About your next question. There are no “links” in this type of salami. They are sausages almost two feet long, clamped with hog-rings or tied with heavy cotton string. There is a special knot to learn how to tie at the top end. We’ll even tie support loops with “half-hitches” on them to hold them while hanging. Of course, spacing the salamis is quite important as air circulation is a major factor in carrying away evaporated moisture (with the help of your computer fan). Why, I’ve even heard that down in Texas, they space them so far apart, you could drive a buckboard between ‘em!

Best Wishes,
Chuckwagon

Dave Zac
Posted: Tue Jun 14, 2011 14:35
Some reading of the first article indicates that I may want to find a potentiometer to control my fan speed. $3-$5 probably at radio shack. One thing I admit I am not good at is electronics and electricity. How do I know I am buying the right "pot" for my fan. In my limited research I have read stories of guys burning up their pots because the motor had too much draw.

What do I need for my computer fan? Any electrical guys out there? I have a 2.2 W fan.  
http://sound.westhost.com/pots.htm

Dave

ssorllih  
☐ Posted: Tue Jun 14, 2011 15:05

Dave is your fan rated for 12 volts DC or 115 volts ac?

Ross- tightwad home cook

Dave Zac  
☐ Posted: Tue Jun 14, 2011 15:26

ssorllih wrote:  
Dave is your fan rated for 12 volts DC or 115 volts ac?

12 V DC. I plan to power it from an old computer power supply.

Dave

ssorllih  
☐ Posted: Tue Jun 14, 2011 23:09

200 ohms at 2 watts should be good but if you can get a 4 or 5 watt pot for a fair price go for that. Connect the power supply to one of the outside terminals and one lead of the motor to the center terminal.

Ross- tightwad home cook

ssorllih  
☐ Posted: Wed Jun 15, 2011 01:42

I read the description of the equipment needed and I believe that I can pretty much make do although some of my stuff may seem a bit archaic. My gram scale is good for 120 grams by .01 milligram torsion balance and my larger scale is a double beam baby scale that will resolve 1/8 ounces to 32 pounds.

Ross- tightwad home cook
Hi sausage makers working on Project-A!

While we are reading about bad bugs and bad manners, how about allowing me to expand just a bit on some of the material you’ve read about microorganisms and their effect on our fermented meat products and possible effects upon our bodies. I do not expect you to remember all the data I’ve presented here, I just thought I’d put the following information together for your further reading in case you’d like to know more about the bugs we are contending with. I’d like to present three pages for you to read at this point in our project. You may wish to copy n’ paste these three pages for your reference notes. The first deals with the causes of food poisoning. The second describes some of the most vicious pathogenic bacteria we have to deal with. The third page describes yeasts and molds, and such tough-to-get-rid-of microorganisms as spores and even some of the non-bacterial contamination we may encounter, such as *trichinella spiralis* – a microbial, nematode worm!

- Page 1 –

Each year in the United States food borne diseases cause approximately 76 million illnesses and 325,000 hospitalizations*. Of this number, more than 5,000 Americans painfully suffer the clearly evident indications and symptoms of preventable food contamination, breathe their last breath, and agonizingly die!

* statistics from Center For Disease Control

Three pathogens in particular - *Salmonella*, *Listeria*, and *Toxoplasma* - are responsible for 1,500 deaths annually. Many of the pathogens of greatest concern today, were not even recognized as causes of food borne illness merely twenty years ago! They include *Campylobacter jejuni*, *Escherichia coli O157:H7*, *Listeria monocytogenes*, *Cyclospora cayetanensis*, and others.

Other pathogenic bacteria of concern to sausage makers include *Clostridium botulinum* whose spores produce the deadliest toxin known to man, and *Clostridium perfringens* - both of which grow without oxygen present. *Staphylococcus aureus* is present in the mouth, nose, and throat as well as on the skin and hair of many healthy people who never suspect it. One cough or sneeze may be accountable for the sickness of countless individuals. *Shigella*, also a rod-shaped pathogenic bacterium, is closely related to *E.coli* and *salmonella*. Usually ingested, it is the cause of severe dysentery. Also rod-shaped pathogens of bacteria genus bacillus include *Bacillus cereus*, which causes a foodborne illness similar to that of *staphylococcus*.

We live in a microbial world in which there are limitless opportunities for pathogenic or spoilage microorganisms to contaminate food whether it is produced in huge commercial kitchens or prepared “from scratch” at home. Food borne microbes are present (usually in the intestines) in healthy animals raised for food and the slightest contact with even small amounts of intestinal contents may contaminate meat or poultry carcasses during slaughter. Others are passed along by any number of means. As a result, worldwide each year, over two million people die from diseases attributed to contamination of food and drinking water, many being painful diarrhoeal
diseases. Even in industrialized countries, up to 30% of the population have reported suffering from foodborne diseases annually.

Recently in Europe, two and a half million pounds of beef were recalled due to salmonella contamination. In the United States, a single ice cream producer affected 224,000 persons when salmonella contaminated products were placed on the market. Earlier, an outbreak of hepatitis A, resulting from the consumption of contaminated clams, affected some 300,000 individuals in China. In the United Kingdom, two million cases, (about 3,400 cases per 100,000 inhabitants), of food contamination are reported each year. In France, three quarters of a million people (1,210 cases for 100,000 inhabitants), report food contamination sicknesses annually. Australia reports an estimated five and a half million cases of food-borne illness every year, causing 18,000 hospitalizations and 120 deaths. The problem creates an enormous social and economic strain on people in every country. In the United States alone, diseases caused by the major pathogens are estimated to cost over $35 billion dollars annually in medical costs and lost productivity.

So, why am I including this ghastly information in the midst of our sausage making project? Frankly, to scare the daylights out of you! What better place to print explicit and even graphic details in which every responsible sausage maker should become familiar before undertaking the business of feeding or preparing sausage for other people? A trusted sausage maker or cook may either promote or recklessly endanger the health of other human beings. I openly cringe whenever I hear someone repeat the words “he’s just a cook”. Inside our ranch kitchen, cowboys helped with dishes and treated the cook as if he were royalty. After all, although he was “just the cook”, all hands depended upon the “biscuit wrangler” to feed us fresh, tasty, and safely prepared food. Shucks pards, we all knew he could have easily slipped a little something extra into the chocolate pudding anytime he had revenge on his mind. We also trusted and relied upon him to help keep harmful bacteria out of the sausage and meat products we devoured like hungry wolves.

Safety n’ Savvy

Before you begin making sausages in your own ranch or home kitchen that others will consume, you MUST become familiar with the basics of food handling safety and gain at least a fundamental insight of microorganisms and their behavior. Without this knowledge, you may very easily harm someone most seriously. Making fresh sausage involves the use of immaculately clean utensils and low processing temperatures. We must take advantage of every opportunity to lower the temperature of the meat during the various steps of processing sausage. Those of the cured, cooked, and smoked variety, require the same essentials, but further include the use of sodium nitrites and nitrates, higher salt content, and of course, higher cooking temperatures. If you wish to make any type of dried or semi-dried sausage, a basic understanding of the fermentation process becomes necessary, along with an elemental knowledge of unique, acid-producing, microorganisms and their behavior. In other words, because the meat in these sausages is not cooked during preparation or even upon consumption, a bit more “bacteria savvy” is required. Further, in making those great tasting, tangy, “fermented” sausages, familiarity with a few unique safety procedures involving yeast and mold microorganisms is essential. They include at least an elemental understanding of:
1. **Water activity** (Aw) - a measure of how much “bound” water is available to microorganisms.

2. **pH acidity** - (potentiometric hydrogen ion concentration) - a measure of acidity or alkalinity in food, developing resistance against microbiological spoilage.

3. **Microbiology**, including:
   a. molds
   b. yeasts
   c. bacteria of three types:
      1. pathogenic
      2. beneficial
      3. spoilage

**The Major Causes Of Food Poisoning**

1. **Pathogenic Bacteria**

   Of the three microorganisms affecting food (bacteria, yeasts, and molds), pathogenic bacteria, existing virtually everywhere in our environment, remain the greatest cause of food poisoning. Sausage makers and food handlers must be aware of the strains of (a.) food spoilage bacteria, (b.) pathogenic bacteria, and (c.) beneficial bacteria. Millions of microbes may be found on unwashed hands and dirty utensils and under the right conditions, multiply at an alarmingly incredible rate.

   As sausage makers, we must constantly be aware of the primary factors necessary for bacterial growth. We must also know how to change any dangerous circumstances immediately. Bacteria need merely four elements for growth:

   (1.) **moisture**- Did you ever imagine that meat is comprised of three-quarters water? If we freeze the water in meat, we give it temporary defense against bacteria by “binding” the moisture. Moisture is the primary reason meat spoils. Will dehydrating meat preserve it? We’ve been doing just that for thousands of years!

   (2.) **nutrient**- Meat, (mammalian muscle) consists of roughly 75% water, 19% protein, 2.5% fat, 1.2% carbohydrates, and 2.3% non-protein substances such as amino acids and minerals. Exposed to the atmosphere, meat becomes a virtual feast for bacteria.

   (3.) **warm temperature**- Bacteria thrive at body-temperature! Called the “danger zone”, the range from 40°F. (4°C.) to 140°F. (60°C.) is the optimum temperature periphery for bacteria to multiply. It is interesting to note that bacteria are restricted from growing at 130°F. (54°C.) but actually start to die at 140°F. (60°C.).

   (4.) **lack of oxygen**- Aerobic bacteria need oxygen; anaerobic bacteria do not. Certain pathogenic bacteria in sausage being smoked certainly present a risk. Casings also cut off a certain volume of oxygen as does the “overnight curing” covered with plastic wrap inside a refrigerator.
Remember the first rule of sausage making: Don’t smoke it if you can’t cure it! (meaning the use of actual cures of sodium nitrate or sodium nitrite).

Bacteria, have been named mostly in Latin or Greek, for their shape. Spherical bacteria are called cocci. Rod-shaped bacteria are known as bacilli. Curved bacilli (resembling a comma), are called vibrio. If they are spiral-shaped, the are called spirilla, and if the bacilli is tightly coiled, it is called spirochaetes. Many bacteria exist simply as single cells. If they are found in pairs, they are neisseria. The streptococcus form chains while the staphylococcus group together in clusters resembling grapes.

If a specific bacterium is a facultative anaerobic, it is most active in oxygen but can survive without it. On the other hand, an obligate anaerobe cannot grow in the presence of oxygen. Bacteria do not grow in size - they multiply in number. And they do it very quickly! Without oxygen, the addition of sodium nitrates or sodium nitrites is necessary to prevent botulism. It also becomes crucial that meat be removed from the “danger zone” temperature range as quickly as possible during any preparation or cooking process. This includes grinding, mixing, and stuffing sausages, procedures often supported using ice, ice water, or refrigeration and freezing. As bacteria need moisture to multiply and meat is about three-quarters water, it becomes an ideal environment for the growth of bacteria, even when it is mostly dried. However, there is a point in which meat can lose so much “available” water, it will no longer sustain bacteria. This point differs within each particular type bacterium. We’ll discuss this “water activity” later as well as another bacteria destroying process known as potentiometric hydrogen ion concentration… or simply “pH acidity”.

Our first line of defense continues to be the application of extreme temperatures applied to meat either being cooked or frozen. As sausage is prepared, it is essential to work with only small batches at a time outside the refrigerator. Very often, meat is partially frozen before it is put through a grinder and bacteria at this temperature remain mostly inactive. In the grinder, ice chips are sometimes added to keep the temperature down as the friction of grinding actually warms the meat. Out of the refrigerator, most bacteria begin to wake up as the temperature rises above 40°F. (4.4°C.). At 50°F. (10°C.), it is safe to work with the meat only temporarily before it goes back into the refrigerator. At this point, salt in the amount of 2.5% - 3% is frequently added to partially restrict pathogenic and spoilage bacteria growth, as beneficial bacteria go to work producing protective acidity within time. Most bacteria thrive at the temperature of our bodies (98.6°F. / 36.6°C.). As temperatures rise much above the “danger zone”, their growth becomes restricted until around 140°F. (60°C.), they begin to die. Yet, strains such as Clostridium botulinum, may survive heating up to 250°F. (121°C) by producing heat-resistant, isolating envelopes called spores - nature’s way of protecting the organism by sheltering the bacteria from other unsympathetic environmental conditions.

- Page 2 –

Clostridium botulinum - The Killer

Clostridium Botulinum is a common obligate anaerobic bacterium microorganism found in soil and sea sediments. Although it can only reproduce in an oxygen-free environment, when it does
reproduce, it produces the deadliest poison known to man - botulinum toxin. One millionth of a gram ingested means certain death - about 500,000 times more toxic than cyanide. Onset of symptoms can occur quickly and include nausea, stomach pain, double vision, and spreading paralysis, ultimately reaching the heart or respiratory organs. If treatment is given and the dose is low, half of those affected may survive, but recovery may take months or years. Although fatalities occur yearly, especially in countries where home canning is popular, the risk of acquiring botulism is very, very low. However, the lethal consequences of poisoning may make you wish to reconsider the proper addition of sodium nitrate/nitrite in your products to almost eliminate the risk. Worldwide, there are about 1000 cases of botulism each year.

The rod-shaped bacterium was first recognized and isolated in 1896 following the poisoning of several people who had consumed bad ham. It was later discovered that due to the enzyme superoxide dismutase, the bacterium might actually tolerate very small traces of oxygen. *Botulinum* spores are extremely persistent and will survive heating up to 250°F. (121°C), freezing, smoking, and drying. Insidiously, they lie in wait for the right conditions to occur and give no foul smell or taste, making it even more treacherous. In non-cooked fermented sausages, the microorganism must be destroyed using a combination of salt, a drop beyond 5.0 pH, and a minimum drop in Aw water activity to 0.97 or less. Placing fresh vegetables or un-sterilized (garden fresh) spices into sausage is not recommended as *botulinum* spores are not uncommon on leafy herbs, peppers, beans, chilies, and corn. Cut off from oxygen by being stuffed into casings and placed in a smoker, the smoking temperatures are ideal for bacteria growth. The risk using fresh garlic is less, but cases of botulism poisoning have been reported after people have eaten home-canned garlic cloves in oil - the ideal environment for anaerobic bacterial growth!

The most commonly recognized foodborne infections are those caused by the bacteria species *campylobacter*, *salmonella*, and *E.coli*, along with a group of viruses called *elicivirus* also known as the Norwalk and Norwalk-like viruses. *Campylobacter* remains the most common bacterial cause of diarrheal illness in the world and incredibly, most raw poultry meat has *campylobacter* on it. *Salmonella* is also a bacterium widespread in the intestines of birds, reptiles, and mammals. Its infection, known as *salmonellosis*, typically includes fever, diarrhea, and abdominal cramps. *E.coli 0157:H7* is a bacterial pathogen infecting cattle and other similar animals. Human illness typically follows consumption of food or water that has been contaminated with microscopic amounts of cattle feces. The illness it causes is often a severe and bloody diarrhea with painful abdominal cramps, but without much fever. In 3% to 5% of cases, a complication called hemolytic uremic syndrome (HUS) can occur several weeks after the initial symptoms. This severe complication includes temporary anemia, profuse bleeding, and kidney failure.

Norwalk and Norwalk-like virus (*calicivirus*) is an extremely common cause of foodborne illness, though it is rarely diagnosed, because its laboratory test is not widely available. It causes an acute gastrointestinal illness, usually with more vomiting than diarrhea, that resolves within two days. It is believed that Norwalk-like viruses spread primarily from one infected person to another. Infected kitchen workers can contaminate a salad or sandwich as they prepare it, if they have the virus on their hands. Infected fishermen have contaminated oysters as they harvested them. Sausagemakers, wash your hands!
Although other routes usually transmit them, some common diseases are occasionally produced by foodborne bacteria. These include infections caused by *shigella*, *hepatitis A*, and the parasites *giardia lambia* and *cryptosporidia*. Even “strep throats” have been transmitted occasionally through food.

Indeed, we live in a microbial world with countless opportunities for food to become contaminated as it is produced and prepared. Many food borne microbes are present in healthy animals (usually in their intestines) raised for food. In the kitchen, microbes may be transferred from one food to another food by using the same knife, cutting board or other utensils to prepare both without washing the surface or utensil in between. Worse, a food that is fully cooked can become re-contaminated if it touches other raw foods or drippings from raw foods that contain pathogens.

A “*strain*” is a sub-group within the species of a particular bacterium having unique characteristics distinguishing it from other strains. These differences are often detectable only at the molecular level; yet, they may result in changes to the physiology or lifecycle of the bacterium. Some strains develop pathogenic capacity becoming hostile to our food supply.

Many bacterial microbes need to multiply before enough are present in food to cause disease. The way food is handled after it is contaminated can also make a difference in whether or not an outbreak occurs. Given warm moist conditions and an ample supply of nutrients, merely one reproducing bacterium dividing itself every half hour can produce 17 million progeny in only 12 hours! As a result, lightly contaminated food left out overnight can be highly infectious by the next day. If the food were refrigerated promptly, the bacteria would not multiply at all. In general, freezing prevents nearly all bacteria from growing but merely preserves them in a state of “suspended animation”. However, this general rule has a few surprising exceptions. Two foodborne bacteria, *listeria monocytogenes* and *yersinia enterocolitica* can actually grow at refrigerator temperatures! As we shall see, high salt, high sugar, or high acid levels keep bacteria from growing, which is why salted meats, sweetened jam, and pickled vegetables are traditionally preserved foods.

**Staphylococcus Aureus**

*Staphylococcus aureus* is a particularly infamous nasty strain of bacteria that thrives at 98° Fahrenheit, causes intense vomiting, and much like *clostridium botulinum*, it is capable of producing toxins that remain in meat even after the microorganism is destroyed or removed. Most often found around the nose and throat or on sores, the foods most often contaminated with *staphylococcus* are moist and high in protein, such as meats and cheeses. The bacteria are usually passed onto food by the hands. “Staph” is even more dangerous because there is no tangible way to tell if meat is infected - taste, aroma, and appearance all seem normal. Moreover, it is highly resistant to drying and in the presence of oxygen, it can survive in Aw water levels down to an incredible 0.86. Worse, it can withstand a whopping 15% salt! Proper temperature management is essential - no, it is critical - in avoiding the spread of *staphylococcus* microorganisms. Cooked foods that are not cooled quickly enough or that are allowed to stand at room temperature are susceptible to infection. In fermented (not cooked) sausage, a rapid drop to less than 5.3 pH is
required for its demise. In fresh or smoked-cooked-cured sausage, normal cooking temperatures exterminate the bacterium.

**E. coli**

The rod-shaped, facultative anaerobic, *E. coli* (*escherichia coli*) bacteria are commonly but not always confined to the lower intestine of warm-blooded organisms. Most are harmless and one strain in particular has been used in the development of probiotic medicine developed to treat gastrointestinal infection. However some strains, such as serotype 0157:H7, 0104:H21, and 0121, can cause potentially lethal toxins. The *strain 0157:H7* especially may cause serious food poisoning in humans, as well as other life-threatening complications. The ability of *E.coli* bacteria to survive for brief periods outside the body makes them ideal candidates for fecal contamination. The bacteria survive freezing and acidic environments down to 4.0 pH and a minimum drop in Aw water activity to 0.95. Untreated water, unwashed hands, flies, or vermin can then spread the bacteria. As plants are eaten, the cycle continues. As with *staphylococcus aureus*, it is best destroyed using heat.

**Salmonella**

*Salmonella* bacteria do not produce spores, are not destroyed by freezing, and are *facultative anaerobic*, meaning they are active in oxygen but can survive without it. This is the nasty bug that causes Typhoid Fever! In food, it is the cause of *salmonellosis*. The rod shaped bacteria live in the intestinal tracts of humans and animals and are passed in the excreta of an infected host. Untreated water, unwashed hands, flies, or vermin can then spread the bacteria. *Salmonella* can survive for weeks outside a living body and have even been found in dried excrement after nearly three years. The foods most commonly infected with bacteria are poultry, eggs, and all kinds of meat. Thorough cooking of these foods at a temperature of at least 165°F. (74 &ordm;C) will destroy the *salmonella* bacterium. Each year, about 40,000 Americans are infected with food borne salmonella and develop *salmonellosis*. Amazingly, another 142,000 are annually infected with *Salmonella enteritidis* solely from consuming raw chicken eggs! About 30 die. In non-cooked fermented sausages, the microorganism must be destroyed using a combination of salt, a drop to less than 3.8 pH, and a minimum drop in Aw water activity to 0.94.

**Clostridium Perfringens**

*Clostridium perfringens* bacteria, like *salmonella*, is present in the intestines of humans and animals, but like *clostridium botulinum*, it is an *obligate anaerobic* and cannot grow in the presence of oxygen. The bacteria forms spores that survive very well in soil - thus vegetables may carry the organisms. *Clostridium perfringens* bacteria are most commonly found in raw foods, especially meats and poultry, and proper temperature management is fundamental in avoiding the spread of the microorganisms. In non-cooked fermented sausages, the bacteria must be destroyed using a combination of salt, a drop to a point less than 5.5 pH, and a minimum drop in Aw water activity to 0.93.

**Listeria Monocytogenes**
In October 2002, a major poultry producer in Franconia, Pennsylvania, recalled more than twenty-seven and a half million pounds of turkey and chicken “ready to eat” products they had already placed on the market. Following an outbreak of listeriosis, several other meat companies voluntarily shut down operations until the source could be identified. Unfortunately, listeria infection (listeriosis) in several northeastern states had taken its toll, initiating several deaths, sicknesses, miscarriages, and stillbirths.

Each year in the United States, an estimated 2,500 persons become seriously ill with listeriosis. Another 500 die, causing listeriosis to be the leading cause of death from food borne bacterial pathogens! Twenty to thirty percent of infections result in death! Listeriosis infection is caused by eating food contaminated with the bacterium Listeria monocytogenes. Pregnant women are twenty times more likely to contract listeriosis than other healthy adults and account for a third of all reported cases. The elderly, and persons with weakened immune systems due to cancer, diabetes, kidney disease, and other diseases, are especially at risk.

The rod-shaped Listeria monocytogenes bacteria do not produce spores and are found in soil and water. Most often, the bacteria get into food using manure as a fertilizer from animals having the infection yet displaying no ill symptoms. The bacterium is destroyed by heat while cooking or preparing food. Uncooked meats and vegetables and unpasteurized (raw) milk or foods made from unpasteurized milk may contain the listeria monocytogenes bacteria. Foods to be concerned about include soft cheeses and cold cuts at the deli counter, and many ready-to-eat foods such as hot dogs and raw vegetables. These items must be thoroughly cooked until they are steaming hot! Check the labels on Feta, Brie, and Camembert, any blue-veined cheeses, and Mexican cheeses such as Queso Blanco, Queso Fresco, and Panela. Unless labels clearly state they are made from pasteurized milk, avoid them. It is always a good idea to eat smoked seafood only in cooked dishes such as casseroles.

Whenever making fresh sausage from any raw meat, protection from listeria monocytogenes is dependent upon cooking the meat until the recommended internal meat temperature of at least 152°F. (66.6°C.) is reached. In non-cooked fermented sausages, the microorganism must be destroyed using a combination of salt, a drop to less than 4.4 pH, and a minimum drop in Aw water activity to 0.92. Sausage making is completely safe only when the rules are stringently followed.

**Campylobacter Jejuni**

It is now estimated that half of the chickens produced in America contain the spiral rod-shaped campylobacter jejuni microorganism that infects 13 persons in one hundred thousand. The bacterium does not produce spores. World wide, it affects about two and a half million people annually or 0.8% of the population. Most people who become ill with campylobacteriosis get diarrhea, cramping, abdominal pain, and fever within two to five days after exposure to the organism. The diarrhea may be bloody and can be accompanied by nausea and vomiting. The illness typically lasts one week. Although comparatively few people die from the disease (about 125 each year), the symptoms are harsh and painful, usually requiring medical attention. Many chicken flocks are infected with campylobacter but show no signs of illness. In non-cooked
fermented sausages, the microorganism must be destroyed using a combination of salt, a drop to less than 4.9 pH, and a minimum drop in Aw water activity to 0.98. *Campylobacter* may be easily spread from bird to bird through a common water source or through contact with infected feces. When an infected bird is slaughtered, *campylobacter* organisms are easily transferred from the intestines to the meat.

**Shigella**

Reactive arthritis is autoimmune condition that develops in response to an infection in another part of the body. People developing an infection having come into contact with *Shigella* bacteria, often develop severe dysentery and reactive arthritis. Infection is made though fecal-oral contamination and as few as ten cells may trigger the disease *shigellosis*. The rod-shaped bacterium does not produce spores, is closely related to E.coli, but is found naturally only in man and apes. It does not affect other animals. In non-cooked fermented sausages, *Shigella* bacteria must be destroyed using a combination of salt, a drop to less than 4.0 pH, and a minimum drop in Aw water activity to 0.91.

**Bacillus cereus**

*Bacillus cereus* is a rod-shaped bacterium that develops spores. Some strains are harmful to humans when survival of bacterial *endospores* takes place whenever food is improperly cooked. This problem is compounded when food is then improperly refrigerated, allowing the spores to germinate. Infection causes severe nausea, vomiting, and diarrhea. In non-cooked fermented sausages, bacillus cereus must be destroyed using a combination of salt, a drop to less than 4.3 pH, and a minimum drop in Aw water activity to 0.91.

Other strains of *bacillus cereus* can be beneficial as probiotics. The bacteria are facultative anaerobic (most active in oxygen but can survive without it) and are found mostly in the soil. The bacterium is difficult to identify, as it closely resembles *staphylococcus aureus* and other pathogens. *Bacillus cereus* is also known to cause problematic skin infections in humans that can be quite damaging, and difficult to eradicate.

2. Food Spoilage Bacteria

Mother Nature has always employed an efficient and practical means for reducing and eventually eliminating waste. Surplus organic material (without preservatives) no longer needed or not consumed while fresh, simply wastes away with the infection of several types of bacteria. Most often, a product simply falls apart and eventually disintegrates. Meats spoil by food spoilage bacteria breaking down proteins and fats. *Brochotrix thermosphacta*, *pseudomonas spp.*., or a host of other spoilage-type bacteria, usually cause not only slime and discoloration, but also objectionable odors, terrible tastes, and intolerable textures as well. Each has its preferred temperature range for quick reproduction and some are most active inside a refrigerator. Others are active at room temperature or even smokers, heated up to 140°F. (60°C.). Although spoilage bacteria may not be life-threatening, they may certainly make life miserable for a week or two, if ingested in spoiled food. How do we stop food spoilage bacteria? Sometimes we can’t before it
does its damage. However, most cannot survive a drop below Aw 0.85. Dried foods? Most are very palatable but not always preferred or practical.

You may wonder how the Great Plains Indians kept fresh buffalo meat from spoiling. Without salt, and plenty of it, bison jerky did indeed spoil! Rarely did they have freshly killed meat as an alternative to tough, chewy, dried buffalo jerky and most often it had to be soaked a few hours just to relieve enough of its salt content to make it palatable.

Although the spoilage bacteria is unpleasant, it is the pathogenic bacteria with which we are most concerned, as its presence in contaminated food is not always made evident by irregular odor, color, texture, or other normally perceptible means.

- Page 3 -

**Microorganism Type 2. (Yeast)**

It is estimated that only 1% of all yeast species have been described. *Yeasts* are microscopic fungi that grow as single cells. They will grow on the surface or near the surface inside non-cooked, air-dried, fermented sausages, while *molds* grow only upon the surface. Neither yeasts or molds are affected by the pH drop during the fermentation stage of sausage making and as long as a high degree of humidity is sustained, they will grow within a wide temperature boundary. However, the two microorganisms grow much slower than bacteria and during the drying process, they develop much later. Both yeast and molds are entirely part of traditional sausage making as both metabolize some of the lactic acid created during fermentation. Increasing the pH, thus lowering acidity, the flavor of slowly fermented sausage is greatly enhanced. Yeasts are not as sensitive to increased levels of salt as are lactic acid bacteria and they need little oxygen to survive. Two yeasts especially tolerant of salt are *Debaromyces hansenii* and *Candida formata*.

Unlike bacteria, there are no known species that grow only *anaerobically* (obligate anaerobes). Yeasts grow best in a neutral or slightly acidic pH environment but are able to grow in foods with a low pH, (5.0 or lower) and in the presence of sugars, organic acids, and other easily metabolized carbon sources. During their growth, yeasts metabolize some food components and produce metabolic end products. This causes the physical, chemical, and sensory properties of a food to change, as the food is spoiled. The yeast of the *Zygosaccharomyces genus* have long been associated with the food industry as a spoilage yeast. These species are able to grow in some of the more commonly used food preservation concentrations including ethanol, acetic acid, sorbic acid, high sucrose, benzoic acid, and sulfur dioxide.

**Microorganism Type 3. (Molds)**

Molds are microscopic fungi that grow in the form of multicellular filaments called *hyphae*. Ubiquitous in nature, molds are aerobic and grow on the surface of sausages. Wild growing “white” molds have been used for centuries on sausage surfaces to help prevent oxygen from penetrating the sausage and to help regulate or temper the drying cycle. Mold also oxidizes lactic acid - increasing pH, and it consumes oxygen to produce *catalase*, thereby reducing lipid oxidation and rancidity of fats. *Penicillium nagliovense* in particular, promotes *lipolytic*
(breaking down of fats) and proteolytic (breaking down of proteins) development, greatly improving the flavor of fermented, air-dried sausages. In order to grow, molds need 75% humidity or more and higher temperatures facilitate their development. The sausage maker’s favorites include *penicillium nagiouvense* and Fleming’s *penicillium chrysangenum*, from which the miraculous antibiotic penicillin was developed.

**Spores And Mycotoxins In Molds**

Some molds also produce spores and subsequently, mycotoxins. When mold spores are present in large quantities, their mycotoxins can certainly present a health hazard to humans and animals, potentially causing allergic reactions and respiratory problems. Exposure to (or consumption of) high levels of mycotoxins can lead to neurological problems and in some cases... death! *Molds of color, especially green, should be wiped away with vinegar immediately.* Although it is generally accepted that wild white mold is safe, it yet remains a wild mold and therefore its safety remains a gamble. For this reason, it is suggested that starter cultures, purchased from a reputable company, be used in sausage making to control microorganisms. I prefer and recommend the very fine Chr. Hansen Bactoferm™ products made in Denmark and distributed in Germany. To start a mold culture on sausage, most sausage makers dip them into a solution just before they go into the fermentation room or chamber having raised temperature and higher humidity - ideal growing conditions for fungi. I like to spray them using an atomizer. And yes, you really should put a little ventilation into your curing chamber. A couple of well placed 30-30 rounds should do the trick!

There will always be skeptical ol’ timers and hardy, dogmatic ol’ folks who may say, "We’ve never used that ‘newfangled bio-culture stuff” to make salami - our good ol’ mold has been successful for years, and we haven’t killed anybody yet, so what’s the big deal”? Well, I have but one question… and I’ve wondered about it for some time. Just how many folks over the years have died of "natural causes"? 😐

**How Bacteria Multiply**

Microorganisms do not grow in size - they multiply in number. And they do it very quickly! Lets take a look at the bacteria count of two particularly infamous nasty strains - *E.coli 0157:H7* and *staphylococcus aureus* - both bacteria thrive at 98° Fahrenheit. It is crucial that meat be removed from this temperature range as quickly as possible during any sausage making preparation or cooking process. Because *staphylococcus aureus* bacteria are most often found around the nose and throat or on sores, and the foods most often contaminated with *staphylococcus* are moist and high in protein (such as meats), hands must be scrubbed, a hairnet or hat worn, and any contact with the mouth, nose, or acne sores etc., must be eliminated. **Coughing or sneezing is inexcusable and indefensible during any phase of the sausage making process!** The bacteria are usually passed onto food by the hands. “Staph” is even more dangerous because there is no tangible method to indicate whether the meat is infected; the taste, aroma, and appearance all seem normal. Proper temperature management is not only necessary, it is critical in avoiding the spread of *staphylococcus* microorganisms. Cooked foods not cooled quickly enough or are allowed to stand at room temperature too long, are susceptible to infection. How quickly do bacteria develop? Left on a table top on a warm late spring day, bacteria actually double each
twenty minutes! In other words, *E.coli* and *Staphylococcus aureus* bacteria in “sterile meat” may easily number above 25,000 in three short hours without refrigeration. Worse, if the meat is ground into burger, the increased surface area increases the risk exponentially!

Non-Bacterial Contamination - (Parasites)

Trichinella Spiralis

*Trichinella spiralis* is a parasitic roundworm whose larval form may be present in the flesh of pork or wild game and its painful infection is known as *trichinosis*. The best way to eradicate the dangers of the *trichinella spiralis* larva is to simply cook the meat thoroughly. However, not all sausagemaking procedures allow the meat to be fully cooked or even cooked at all. In these cases, “certified pork” must be used; pork that has been deeply (sub-zero) frozen for a prescribed amount of time. Because of new USDA regulations in American hog production during the 1970’s and 80’s, the disease in modern America has mostly been eradicated. For decades preceding the new rules, many hog producers fed hogs the entrails of other butchered hogs as the cycle continued until the modern rules were put into effect. By public demand over an extended period of time, American pork has become less fatty and mostly trichinae free. It is interesting to note that in England, as well as in many other hog producing countries, *trichinella spiralis* is virtually unknown.

Always follow the recommended cooking temperatures in recipes. The internal temperature of cooked fresh pork must reach at least 150 °F (65.5 °C). All hot smoked sausages should be cooked to 155 °F (68 °C). Cold-smoked or air dried sausages, whose formulas contain Prague powder #2, should be cooked to 120-135 °F (49-57 °C). Never judge by looks alone, whether meat is cooked sufficiently, and always check the internal temperature using an accurate meat thermometer.

Cryptosporidium Paryum

*Cryptosporidiosis* is a diarrheal disease caused by the microscopic parasite *cryptosporidium paryum*. Both the disease and the parasite are known as "crypto", and there is no effective treatment or cure for the nasty stuff. The parasite lives inside the intestines of humans and animals and is passed in the stool of both once infected. Most people with healthy immune systems will recover on their own having been infected. So why is it such a concern? Many people affected with other diseases as cancer etc., have weakened immune systems. Worse, the Crypto parasite has a protective outer shell allowing it to survive outside the body for long periods and makes it very resistant to the chlorine disinfection of any city’s water supply. Within the past two decades, *cryptosporidium paryum* (“crypto”) has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. The parasite is found in every region of the United States and throughout the world. Millions of Crypto bacteria may be released in just one bowel movement of an infected human or animal. People may become infected after accidentally swallowing the parasite inside a recreational facility as a swimming pool or by simply eating uncooked food contaminated with *cryptosporidium paryum*. As food is prepared with water taken from a “chlorinated and
disinfected” city’s reservoir supply, Crypto yet thrives. Cooks must destroy any possible contamination by completely cooking any food. How much heat? The USDA recommends at least 152 degrees F.

“Declaring War On The Bugs”

How are we to defeat pathogenic and spoilage bacteria in sausage? Is it possible to starve them? What about salt? How much should we use? We also know that bacteria cannot survive in an environment without moisture, so may we limit the amount of water available to bacteria to destroy them?

All good questions! However, contrary to popular certainty, salt does not destroy bacteria. It doesn’t even force water to evaporate. It does, however, immobilize or bind a specific amount of free water, preventing it from interacting with bacteria (or anything else). The measurement of “bound” water (not available to bacteria) is called “water activity”, and is abbreviated Aw. How about serving a bacterium a dose of salt at first, while we deprive it of moisture? It works. For thousands of years, it has worked! How did your grandparents preserve fresh pork hams and bacons? Perhaps they were pioneers heading westward across the plains in a wagon with bacon, hams, or other cured meats in the larder. Salted hams were dried then “revived” in water before use. Bacon was cured with salt, smoked, and par-cooked. Your grandparents certainly knew that salting and par-cooking meats were positive steps adverse to microorganism survival! They were also aware that if they smoked meat, it not only tasted better but it was not likely to develop mold on its surface. Of course, they had to soak the salt from the flesh just to make it palatable. Nevertheless, it was meat - consumed along the trail, months after it had been initially prepared.

How about introducing acidity as protection against pathogenic and spoilage microorganisms? Bacteria hate acidity, right? But how much is enough? Doesn’t acidity affect the taste of the final product? It’s true, another effective method of preserving meat involves acidity introduced by various means. Of course acidity affects flavor and the addition of an acid is not just a simple resolution for every type of meat. Yet, without lactic acid - producing bacteria, we wouldn’t have wonderful, fermented type sausage. As we lower the pH factor, we increase acidity. Are microorganisms able to survive inside acidic foods? Not when the acidity is increased in a sausage by a drop below 4 pH. Let’s investigate a most effective way of preserving non-cooked, fermented sausages such as salami and pepperoni, using lactobacillus or pediococcus - lactic acid bacteria.

pH - The Measure Of Acidity

Roughly, pH is the measurement of acidity or alkalinity in any substance using a scale from zero to fourteen. Pure water is said to be very close to neutral, having a pH nearly 7.0 at 77° F. Foods with pH less than 7 are said to be acidic, while foods having a pH greater than 7 are said to be alkaline or “base”.

Aw The Availability Of Water
Not all the water in the cells of meat is available to microorganisms. Some of it is “bound” by salt, or other restrictive elements as sugar. The remaining water is known as “free water” and it is the only moisture available to bacteria as well as yeasts and molds. By adding salt or sugar to a sausage, we are able to restrict the amount of “available water” to pathogenic bacteria. Unfortunately, it also restricts available water to beneficial bacteria as well. Freezing water into ice is simply another method of “binding” or keeping water restricted from harmful bacteria. The measurement of “bound” water (not available to bacteria) is called “water activity” or Aw. Water Activity is measured on a scale from 0.00 (called “bone dry”) to 1.00 - the measurement of pure water. Adding salt immediately binds a large amount of water.

**Sterilized Spices In Sausage**

The risk of bacterial contamination is the primary reason the meat industry uses only extracts of spices in cured meat products. In Europe, most dried spices are irradiated with intense gamma rays before packing, effectively killing the spores. Although irradiation for meat was approved in the 1990’s under the Clinton administration, it has been slow to catch on in the United States. The U.S.D.A. recommends the long-established procedure, and declared it to be entirely safe. Herbs and spices freshly picked and plucked from your own garden are fabulous when washed and prepared in foods for immediate consumption. However, a little fresh, non-sterilized basil or oregano, fresh from your prize-winning garden, may rapidly spoil jerky or meat used for sausage in a matter of only a few hours, producing any number of bacteria types. Whenever storing meat overnight for casing sausages, fresh spices will invariably begin to produce pathogenic and food spoilage bacteria, quickly devastating your product. For health’s sake, it is of utmost importance that you use only sterilized spices and herbs purchased from a reputable company, in making sausage.

Is bacterial contamination the only type of food poisoning? Absolutely not. Consider the toxins of poison mushrooms. Many are fatal. Recently in Salt Lake City, an entire Vietnamese family was tragically poisoned having made a mushroom soup from wild mushrooms found in a nearby canyon. Consuming the soup in one picnic meal on an outing, the entire family agonizingly died. Each year, many people become ill having eaten poisonous reef fishes, me included! Pesticides claim their toll also. Similarly, fresh fruits and vegetables can be contaminated if they are washed or irrigated with water that is contaminated with animal manure or human sewage.

**3. Beneficial Bacteria**

Binding available water (Aw) in sausage effectively confines it to a point where harmful *pathogenic bacteria* are no longer able to survive. The process is known as *dehydration* or limiting water activity. For centuries, this process, along with the chance addition of lactic acid-producing bacteria to increase acidity, has been responsible for safely preparing air-dried, fermented, sausages. Today, by adding carefully chosen strains of *lactobacilli* or *pediococci*, reducing the pH acidity to safe levels in fermented sausage has been most effective in destroying competing pathogenic bacteria. Historically, as the sausage maker unwittingly created ideal conditions for competing beneficial bacteria to thrive, pathogenic bacteria were deprived of nutrients, being literally crowded out of the way. Providing optimum temperatures and relative humidity for any number of previously unknown *lactobacilli* and *pediococci* bacteria, safe and
tasty fermented air-dried sausages have been crafted for hundreds of years. Only since about the middle of the nineteenth century has man known what was actually taking place inside the fermentation process. Without beneficial bacteria declaring war on pathogenic bacteria, we would not have salami, pepperoni, summer sausage, or any number of other tangy, fermented air-dried sausages.”

The *staphylococcus genus* includes thirty-two species and eight sub-species. *Staphylococcus Aureus* remains one of the most dangerous pathogenic bacterium known and can even *survive* an incredibly massive dose of fifteen percent salt! However, at least one of its strains has proven to be beneficial by promoting color fixing and flavor forming qualities in air-dried sausages. Closely related to *Micrococcus*, the two micro-organisms provide *beneficial* qualities to fermented air-dried sausages.

Best Wishes,
Chuckwagon

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Seminole says:Bactoferm™ T-SPX - slow culture for making traditional sausages and targeted for temperatures not higher than 24º C (76º F).

Use sugar.
Recipe says use Dextrose. My reading indicates dextrose in fast and medium fermented sausages. Sugar in slow fermented.

Also, thanks for making me read. For some reason I had it in my head that we are using cure 1. The reading indicates (and directions on my BactofermT-SPX) that maybe we should be using cure 2 because of the long term drying and no need to refrigerate when done. Your homework assignment straightened me out on that.

Dave

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I think the dextrose is in there to jump start the Bactoferm T-SPX.
My question is if you know what they fed the pig and you know there was no raw garbage in the feed, will the meat be free of Trichinae? If not how long and how cold Kills the little beasties?

Ross- tightwad home cook
I have assembled my fermentation chamber. Added the salt marsh and fan. With a gallon jug of ice covered with a wet towel I have 66 degrees and 91 % RH. The jug of ice gets a lot of condensate if I don't cover it with a wet towel. Now I have to see if I can get the temperature down below 60.

Ross- tightwad home cook

Hi Dave.
Do you recall reading about the difference in fermentation between American (short dry / sour (tangy) and European (long dry / no sour)? I must confess, the reason I suggested this particular recipe is that we are using the slowest culture – thus more subtle, aromatic flavor – a perfect example of the flavor so many people have never encountered in their lives. They just don’t sell this stuff in the markets of the world. However, we have to “wait” for it. Almost 3 months. But every bit worth the wait – you’ll see. Chr. Hansen says: “T-SPX is particularly recommended for the production of Southern European type of sausages, low in acidity with an aromatic flavor”. Relatively low temperatures below 76˚F. are typical for this type of salami because we just don’t need a high fermenting temperature for such lengthy fermentation. (Short-term ‘sour’ fermentation uses high temperatures in a cure box).

Dextrose is only 70% as sweet as sugar and it is the ideal nutrient for pediococcus pentosaceus and staphylococcus xylosus. High volumes of dextrose (glucose) are never used in long-term fermentation. The reason it is recommended for the fast-fermented sausages is that there is not sufficient time for lactobacilli to break down the sugars. Sugar may be used in a long-term fermentation because it has the time to be reduced. However, dextrose is “ready to go” in any case and utilized immediately.

The reason we use cure #2 in a non-cooked, air-dried sausage, is that we need a reservoir of nitrate to be slowly broken down over time into nitrite. The nitrite in the formula goes to work immediately and is quickly reduced to nitric oxide – the substance that actually cures the meat. By the way, can you name the type of bacteria that must be present in order to react with nitrate to break it down into nitrite?

Hi Ross, You asked:
quote:
Quote:
My question is if you know what they fed the pig and you know there was no raw garbage in the feed, will the meat be free of Trichinae? If not how long and how cold Kills the little beasties?

No one can guarantee such a thing Ross. There are just too many variables. The only positive method would be to look at it through a microscope. However, Trichinae Spiralis has been
almost wiped out in this country. When I was a boy, it was still a threat. Luckily, the USDA made laws prohibiting the sale of pork from pigs that had been fed the entrails of previously butchered pigs. The law had an almost immediate effect on the quality of the meat available to the consumer. As consumers “demanded” further changes in pork, within a few short years the product contained very much less fat also. Most sausage makers believe that this endeavor was a mistake as pork fat equals flavor. Today, you are pretty much safe in buying pork in a store. However, some farmers still practice the old style feeding habits with the attitude that “it never hurt their daddies – why should it hurt them?”

Ross, I’m glad you’re experimenting with your chamber. That is our next move. I was going to have everyone finish up their chamber by the middle or end of next week so we can begin testing for humidity and temperature stability. I recommend… any method you can come up with for producing a variable temperature and humidity exchange. Keep testing and be sure to RECORD your findings. Nice going pard!

Oh yes, about your question concerning the destruction of the beasties... Click on this link: http://wedlinydomowe.pl/en/viewtopic.php?t=4808

Good work, Wranglers!
Best Wishes,
Chuckwagon

Dave Zac
Posted: Thu Jun 16, 2011 02:27

One more quick question on chamber and fan. I have cut a 2” hole in the back of my chamber and mounted the computer fan to the back of the chamber. After doing this I started to wonder if the hole will be a detriment to humidity and temperature control. Seems to me most I have seen have a fan sitting inside the chamber.

Should I re do the back to eliminate the opening and install the fan inside the chamber? My first thought was fresh air circulation would be good. I guess the other option is to simply watch it after I get started. I really don't want to be messing once I'm started though.

ssorlih
Posted: Thu Jun 16, 2011 03:25

I still must attach the stick racks.. I am allowing 3- 24 inch long sticks on 6 inch centers starting 3 inches from the walls. My casings are somewhat smaller at 2.4 inches. I figure this will work out to about 6 sausages instead of four.

Will I need to prolong the drying time to develop the flavors? Or is the drying time dependent on diameter and mass?

The madness in my method was/is that I can get more slices from a smaller diameter.
After I have proved the food safety involved by eating some and living to tell the tale I may share some with those near and dear.

Where is it written that each sausage must be a single full length. Is it permitted to tie the casing in the middle so that with the six expected full casings I will get 12 pieces? I see in the stores many times 6, 8, 12 and perhaps 15 inch cased products.

Ross- tightwad home cook

ssorliih
Posted: Thu Jun 16, 2011 03:36

Dave, My box is fairly tight with the air simply circulating inside. The temperature rises rapidly and the humidity drops when I open the front.

My read on the needs is that for the first 3 days it wants to be pretty damp about 68 degrees in there and then we start slowly dropping the temperature and the humidity.

I am still trying to chill mine down to the upper fifties. I think that I have a handle on the humidity.

I made this with a full inch of foil face foam.

I am thinking that a load of wet sausage or laundry will make control easier. When I get my sticks in there I may hang 10 pounds of wet towels inside and see how it works.

Ross- tightwad home cook

Chuckwagon
Posted: Thu Jun 16, 2011 06:36

Hi Salami Crafters,
We'd sure like to hear how everything is working out for all of you. How's it coming along guys? Did you do some reading? If not, why not take a half hour and catch up?

How are your curing chambers coming along? Everyone should have their supplies ordered by now. We need to hear from Rand in Iowa, JBK in Indiana, uwanna61 in Vermont, SikaStag in Scotland, Gray Goat in Illinois, and Party Cook in Wisconsin. Are you guys making progress? Anybody hankerin' for a slice of the best salami you've ever tasted? Time to ask questions guys.

Best Wishes,
Chuckwagon

Chuckwagon
Posted: Thu Jun 16, 2011 09:08
Hi Dave,
Sausages actually dry a bit quicker at slightly elevated temperatures but to prevent bacterial growth, drying must be done at lower temps usually between 53˚ F. and 59˚ F. The rate of the drying is never constant during the process but is fastest as fermentation begins because there is so much moisture to alleviate. Later on, it slows down to a point where the air is barely moving at all. To start out, the speed should be about 2.2 miles per hour or about a meter per second. Our ultimate goal would be to consistently remove the same amount of moisture being evaporated from the sausages. In reality, this will not happen. But we can come close!

The location of the fan is totally up to you. Use your best judgment. I’ve seen both inside and outside. I chose inside myself just because I can easily restrict the “egress” using a swiveling metal disk to block the vent in varying degrees while still being able to circulate the air inside somewhat. However, we must remember that initially, we need to vent out much of the evaporated moisture so it does not collect on the casings, in which case they will develop slime. If that happens, nasty strange molds may develop. If the sausages are wet during fermentation, the humidity must be lowered.

You wrote:

**Quote:**
Should I re-do the back to eliminate the opening and install the fan inside the chamber? My first thought was fresh air circulation would be good.

Some fresh air is not only good, it’s vital. No, don’t plug the hole. Make it “variable” by restricting the egress as described above. You need it to vent out moisture into the atmosphere. Now let me ask you a question. How would you remedy the “ingress” of air if it were at the same humidity as the egress? I live in an area so dry that we never have to consider such a thing. But I know what elevated humidity feels like. I traveled east once in an air-conditioned car to see the Royals play. It was great until I stepped out. I thought I was going to die! I took a shower and still couldn’t get dry. I couldn’t wait to get back to my high mountain desert where it is so dry that the bushes follow the dogs around! 😃

Hi Ross,
You wrote:

**Quote:**
My casings are somewhat smaller at 2.4 inches. Where is it written that each sausage must be a single full length. Is it permitted to tie the casing in the middle so that with the six expected full casings I will get 12 pieces? I see in the stores many times 6, 8, 12 and perhaps 15 inch cased products.

Ross, that’s a great question. It is absolutely NOT written that each sausage must be full length. The drying rate depends upon the diameter of the sausage. Make them any length you desire. It is nice, however, to have them fairly similar so they will finish about the same time. If you need to have some ready at different stages of completion, start a new batch.
This would be a good time to introduce some observations made by our friend Stan Marianski. On page 104 of his book, “The Art Of Making Fermented Sausages”, Stan lists several interesting facts:

1. The length of the sausage has no influence on drying time.
2. Sausages should be dried at a rate not higher than the moisture losing ability of the sausage.
3. Traditionally made sausage have pH of about 5.3 and Aw about 0.88 at the end of the drying process.
4. The drying chamber should not be overloaded as a uniform air draft is needed for proper drying and mold prevention.
5. The higher the air speed, the faster the drying.
6. Larger pores in certain type casings facilitate faster drying.
7. The more fat there is in a sausage, the faster it will dry.
8. The larger the meat particle size, the faster it will dry.
9. The larger the diameter of a sausage, the slower it will dry.
10. A fully loaded chamber will dry slower as air movement is restricted.
11. Molds will develop more quickly if there is no air draft at all.
12. Excessive drying hardens the surface and closes the casing pores.
13. If the casing becomes greasy, wipe it off with a warm cloth, otherwise it may inhibit drying.

OK sausage wranglers. Let’s hear from you. Get a discussion going with plenty of questions. That’s how we’re going to iron out problems and learn during the process.

Best Wishes,
Chuckwagon

jbk101
Posted: Thu Jun 16, 2011 09:17

Hey Guys,
A little behind the eightball. I am getting ready to order my supplies and have been searching around for some of the items that i might have laying around.

I have started building the cabinet! It will be made out of a 1/4 inch 4 x 8 sheet of plywood that I am going to line with a heavy plastic. I have several old computer fans and a power supply that I will use to power them. I also have some old light fixture to use as a heat source.

I do have a couple of questions 😐
1.) Is the Fan, just mounted inside the cabinet to "just move" the Air around the inside of the cabinet or does it need to be mounted in a way that will either expel or inlet air into the cabinet?

2.) Which way is best to mount the heat source? Top - Bottom or on the sides about half way up?

3.) Would it be better to mount more the 1 fan in the cabinet? I have a lot of old computer fans at my disposal and the power supply that I have would run several at a time without any problem?
4.) If it is okay to mount multiple fans would a configuration as follows be acceptable?
   a.) One fan to just move the air around inside the cabinet!
   b.) One fan to draw air into the cabinet when needed!
   c.) One fan to expel any air (or excess heat) when needed!

   Note: In option b. and c. I would fashion a cover to seal the cabinet when the fans are not needed or in use!

   The finished cabinet is going to be 2' Wide x 3' Tall x 2' Deep

   Thanks,
   John

Chuckwagon

Posted: Thu Jun 16, 2011 09:52

Hello JBK! Sounds like you're cookin' with gas. 😁 And just think... you're only a couple of months away from having ten pounds of great tasting Alysanndra Salami!

You wrote:

**Quote:**
I have started building the cabinet! It will be made out of a 1/4 inch 4 x 8 sheet of plywood that I am going to line with a heavy plastic. I have several old computer fans and a power supply that I will use to power them. I also have some old light fixture to use as a heat source.

Great questions John. All sausage makers should be aware that **light hastens the spoilage of fat in sausage.** It drives butchers crazy all over the world as neon lights especially, tend to change the color of fresh meat very quickly. For this reason, sausage is often made with corn syrup solids which tend to slow down lipid decomposition. However, many home sausage makers use incandescent bulbs to produce heat when needed. This may be the best choice for many reasons, economy being the first. Other methods of heating include electric barbecue starters, crock-pot heater elements, soldering irons, aquarium heaters etc. Oh, and yes... heat rises... mount the source at the bottom of the cabinet. Use your judgment and don’t burn the house down fellars!

JB, check the above response I made for Dave. He asked some of the same questions about inside fans and fresh air etc. One fan should suffice. Too much air circulating will dry out the casings too quickly and seal the moisture inside the sausage. When it can’t get through the casing to evaporate, it is trapped inside and will eventually spoil the sausage.

John, you also asked:

**Quote:**
If it is okay to mount multiple fans would a configuration as follows be acceptable?
   a.) One fan to just move the air around inside the cabinet!
   b.) One fan to draw air into the cabinet when needed!
   c.) One fan to expel any air (or excess heat) when needed!
What a terrific idea! In a larger application, I’m sure it would work very well. However, in our smaller chambers, we only need to move about a meter per second and one fan should handle it easily. I really like the dimensions of your cabinet 2’ Wide x 3’ Tall x 2’ Deep. That should really do the trick!

Terrific John,
Best Wishes,
Chuckwagon

jbk101
Posted: Thu Jun 16, 2011 10:22

Chuckwagon,
Thanks for the response! I noticed that right after I asked my questions that you had just finished posting a response to Dave and that we had some similar questions! Great minds think alike 😊I am hoping to have the cabinet completed by tomorrow night 😊I will take a couple of pictures and post them for your review!

Thanks again,
John

Chuckwagon
Posted: Thu Jun 16, 2011 10:25

Here’s a “reference page” for our Project A.

THE RECIPE:
*Salami di Alessanddra by Stan Marianski*

2.0 kg (4.4 lbs.) pork butt
2.0 kg (4.4 lbs.) beef chuck
1.0 kg (2.2 lbs.) pork back fat (or fat trimmings)
140 g. salt (3%)
12 g. cure #2 *(do not use cure #1 in this recipe)*
10 g. powdered dextrose (glucose)
15 g. sugar (3%)
15 g. white pepper
0.6 g. (1/4 tspn.) Bactoferm™ T-SPX
----- Bactoferm™ Mold 600

Optional:
*Note: To make 5 kg. sausage, about 7 g. of spices and 4 g. of herbs are needed.*

120 ml. (1/2 cup) quality red burgundy or other dry red wine *(Do not exceed ½ cup).*
4 parts coriander (spice)
3 parts mace (spice)
2 parts allspice (spice)
1 part fennel (spice)
3 parts marjoram (herb)
1 part thyme (herb)
1 part basil (herb)

Instructions:

Preliminary steps: Keep a logbook! Record everything you do. Write down dates, times, measurements, etc. Believe me, you’ll refer back to it several times during the process. Save your notes for the next batch. They will be invaluable. Don’t ignore this step. It only takes a few seconds to write down the information you may really need later on.

Thaw the Bactoferm™ T-SPX following the directions on the package. Measure .6 gram (1/4 teaspoon) of the culture and mix it with a little distilled water, allowing the bacteria to “wake up”. Freeze the back fat and nearly-freeze the lean meat. Freeze the grinder plate and blade (20 minutes is plenty). Cut the meat and fat into cubes.

1. Grind the pork and back fat through a 3/8” plate (10 mm). Work in small batches and refrigerate the meat and fat at every opportunity. Grind the beef using a 3/8” plate then again using a 1/8” plate.

2. Mix all the ingredients with the ground meat and develop the primary bind. Fold in the fat particles.

3. Stuff the mixture firmly into beef middles or 46-60 mm. protein-lined fibrous casings, making links about 16 to 20 inches long. (Protein-lined fibrous casings shrink with the salami as the sausage dries.)

4. Weigh each salami and record its “green weight”. Keep a log book!

5. Ferment at 68˚ F. (20˚ C.) for 72 hours, in 85% to 90% humidity.

6. Hang the salamis in the drying chamber and mix the Mold 600 according to the directions on the package. Spray the sausages with a misting sprayer or dip them into a solution. Dry the salamis at 57˚ F. (14˚ C.) in 80-85% humidity for 2 to 3 months (until 30-35% weight loss is achieved).

7. The salamis are stored at (+or- 4˚) 55˚ F. (13˚ C.) in 75% humidity.

Process:....................Temp:......Humidity:.......Length Of Time:
Fermentation......... 68˚ F.......85-90%.........72 Hrs.
Drying...................... 57˚ F.......80-85%...........2 – 3 months
Storage................... 55˚ F.......75%..............until consumed
Participants:
1. Rand......Iowa
2. ssorllih......Maryland
3. JBK......Indiana
4. DaveZac......New York
5. uwanna61......Vermont
6. SikaStag......Scotland
7. Gray Goat......Illinois
8. Party Cook......Wisconsin
9. Chuckwagon......Utah

Meat Starter Culture Bactoferm™ T-SPX
(Slow: Assists with drying a month or more) Also: Semi Dry Cured
Bactoferm™ T-SPX is a freeze-dried culture well suited for all fermented sausages where a relatively mild acidification is desired. T-SPX is particularly recommended for the production of Southern European type of sausages, low in acidity with an aromatic flavor. The culture is suitable for molded as well as smoked fermented sausages. (Semi Dry Cured)
Each 25-gram packet of Bactoferm™ T-SPX will treat 440 pounds (200 kilo) of meat. You can use the whole packet in 100 pounds of meat or use half of the packet and refreeze remaining culture. Use ¼ of a packet in any production under 50 pounds of meat. Note: Cultures must be stored in freezer and has a shelf life of 14 days unrefrigerated and 6 months frozen.
Contains: Pediococcus pentosaceus and Staphylococcus xylosus

Bactoferm:Mold 600 (Previously M-EK-4)
Meat culture for production of moulded dried sausages with a white/cream colored appearance. Mold-600 is a single strain culture containing spores of Penicillium nalgiovense in a convenient freeze-dried form.
P. nalgiovense is a fast growing, traditional white mold culture for controlling the surface flora.
Mold-600 is particularly recommended for the production of traditional sausages dried at low temperature and/or low humidity.
Mold-600 suppresses the growth of undesirable organisms such as indigenous molds, yeasts and bacteria. The culture has a positive effect on the drying process by preventing the emergence of a dry rim. Furthermore, the mold degrades lactic acid during maturation resulting in a pH increase and a less sour flavor.
Note: Cultures must be stored in freezer and has a shelf life of 14 days unrefrigerated and 6 months frozen.

Chuckwagon Posted: Thu Jun 16, 2011 10:40

You're very welcome John. Oh, by the way fellars... When you get a few batches of experience under your belt, and folks have had a chance to taste your wonderful salami, you'd better be ready for a little notoriety in the neighborhood! People will be asking you to make a salami for them. Allow me to present a question to you here. Do you realize what this stuff is worth? 😊
You can't even buy it in markets in this country. I don't know about other countries.
You will have mastered a craft that is almost gone. Sure, right now it seems a little overwhelming. Don't let it be intimidating to you. Read the information and remember what my ol' pappy told me: "The man that doesn't TRY, doesn't DO anything"!

In Europe, the Polish folks have done much to keep the home crafted sausage techniques alive. I am most grateful to these people for sharing their knowledge with others rather than keeping it secret. Shucks pards, guys like Marianski and Gebarowski can share my campfire anytime, and ride my pony too! 😊

Best Wishes,
Chuckwagon

ssorlih  🌟
Posted: Thu Jun 16, 2011 13:53

If you plan to use an incandescent light bulb perforate a large tin can and control the light with a dimmer switch. Water dripping on a hot light bulb will break it.

Ross- tightwad home cook

Dave Zac  🌟
Posted: Fri Jun 17, 2011 01:35

Really dumb question? How do you know your fan is running at 2 MPH? Seems I have read somewhere that there is a paper test for this or something.

Chamber is done, Fan and pot working. Gotta figure out right speed though. Testing humidity and cooling ability now just as Ross is.

ssorlih  🌟
Posted: Fri Jun 17, 2011 01:40

Dave light a candle and walk around slowly with it and watch the flame. Then put it in the box away from the direct blow of the fan and watch the flame. Light an incense stick and watch the smoke curl and drift. One to two MPH is pretty slow. It won't ripple the water on a pond.

Ross- tightwad home cook

ssorlih  🌟
Posted: Fri Jun 17, 2011 04:00

Some simple physics will help us to deal with some of the questions we must have. Air is heavier than water vapor. Air weighs about .076 pounds per cubic foot. Water weighs about 64 pounds per cubic foot. Air and water have a specific heat of about one BTU per pound. The air in my chamber weighs about 12 ounces. The water in my chamber will weigh about
twenty pounds and the meat will weigh about ten pounds as a result the mass of water and meat will be about 40 times the weight of the air. Therefore when I open the chamber I will spill 3/4 pounds of air and replace it with room temperature air. The thermal inertia of the mass of material in the chamber will very quickly cool the new air to the temperature of the material. We won't hold the doors open for an hour so the loss of control will be very short term. I was having extreme control problems when the chamber was empty but for bottle of ice. The more mass that I add the more stable the temperature and humidity become.

Ross- tightwad home cook

uwanna61 🌃
Posted: Fri Jun 17, 2011 04:06

Hey all
Chuckwagon is there a specified start date? My order arrived yesterday, Bactoferm™ T-SPX and Bactoferm™ Mold 600 along with Protein-lined fibrous casings. I do have one dilemma, it's my wife's b-day this Sunday, and well, kind of gotta do the right thing! If the plan is to start this weekend, I will just play catch up, no biggie! 😊

Another note, my eyes are dropping from all the reading 😁

ssorlih 🌃
Posted: Fri Jun 17, 2011 06:00

Awww come on now. Anything less than a hundred pages a week is accidental reading. My Bactoferm also arrived today with a paper that told me of a minimum 12 month shelf life if kept below zero degrees F. Same for the mold spores. This is encouraging because using more than one batch will reduce the cost of each batch. 32 dollars for flora plus the cost of the meat and the seasonings and the casing makes one batch hellishly expensive. But if I make enough in the next twelve months to use all of the casings, in my case three more batches would make four batches total will bring the material cost down to about a dollar per pound. Add three dollars for meat it is still only four bucks a pound for fine dry cured sausage.

Ross- tightwad home cook

Chuckwagon 🌃
Posted: Fri Jun 17, 2011 06:13

Ross wrote:
Quote:
If you plan to use an incandescent light bulb perforate a large tin can and control the light with a dimmer switch. Water dripping on a hot light bulb will break it.

That's one of those, “Now why didn’t I think of that?” answers. What a great idea… and you could even cut some of the glaring light down using the can. Most folks stay away from the light type heater so the fat won’t go rancid. One of the reasons I recommended this particular recipe
was because of the low temperature for the fermentation step. If you have a cellar, room
temperature might already be achieved. We need about 68° F. for 72 hours. After that, we need
to drop the temperature about 10 or 11 degrees for the next 2 or 3 months. Your “heater” will
surely be useful as you go on to craft other products, especially fast-fermented type salami or
pepperoni where the fermentation temperatures are upwards of 100 degrees Fahrenheit.

**Ross** also wrote:

**Quote:**
Dave, light a candle and walk around slowly with it and watch the flame. Then put it in the box
away from the direct blow of the fan and watch the flame. Light an incense stick and watch the
smoke curl and drift. One to two MPH is pretty slow. It won't ripple the water on a pond.

Wow Ross, where are you coming up with all this good stuff? That is terrific.

**Dave** wrote:

**Quote:**
How do you know your fan is running at 2 MPH? Seems I have read somewhere that there is a
paper test for this or something.

Dave, that is a great question. If you are good with math, you may enjoy figuring out the finer
points of air exchange at this link: [http://www.comairrottron.com/airflow_calc.shtml](http://www.comairrottron.com/airflow_calc.shtml)

However, to be honest with you, most people never do bother to actually measure it. I think the
math scares a lot of folks away. Remember that the symbol for “greater than” is > and the
symbol for “less than” is <

Most people simply adjust their fan (or rather, the volume of outflow of the air called "egress"),
so that it just barely keeps the moisture from collecting on the casings. Although my fan keeps
running, I close the vent partially with an adjustable metal disk swinging over the air escape hole
at the rear. This of course, allows the air to circulate inside the chamber rather than being
exhausted.

OK folks, **Uwanna** 61 would like to know if we have a specific start date. This is YOUR project
so you folks should decide what is most convenient for youselves. I’m just the guide who will
make recommendations. Right now, I would suggest that we all test our chambers for humidity
and temperature variation. Ideally, this would require about 2 days but it sounds like Ross and
Dave have got ‘em tested and are ready to go. John and a couple of others might need an
additional day or so. The rest of us could start reading about cultures (Part 3). If I’m not
mistaken, Uwanna already had his curing chamber in place at the beginning of the project. How
do you folks feel about getting started with the grinding and stuffing? Check in please 😊

Best Wishes,
Chuckwagon

jbk101 🍁

Posted: Fri Jun 17, 2011 08:49
Hey Guys,
I have almost completed the cabinet. It is built the Fan mounted and running the Heat Source is in and working! I still have to line it with Plastic and Fashion a cover over the Light Bulbs I also need to Mount my Dowel Rods. Here are some pictures. [NOTE: They’ve gone missing.] Any comments or suggestions for changes etc. would be appreciated 😊

The Finished Cabinet is 17-3/4" Deep x 24" Wide X 36" High

The inside Showing the Lamp and Fan Locations and a Basic Temp/Humidity Gage that I found laying around.

I Drilled holes around the Fan Housing as opposed to cutting out the one Big Hole.

Close up pic of the Basic Temperature / Humidity Gage That I had Laying Around.

4 inch Computer Fan that is being powered by an Old Computer Power Supply.

Pic of the Power Supply that I used and Mounted on Top of the Cabinet.

John, that is absolutely gorgeous! Very nice indeed. You fellars are an inspiration to the rest of us. By the way, we still need to hear from Rand, SikaStag, GrayGoat, and Partycook. Before we actually start grinding and mixing meat, there are a few more items to consider:

1. Distilled water - All the chemicals used to treat your town’s water supply, can really raise hello with the bacteria we need in Bactoferm. You can purchase distilled water, but home crafters like us can easily make our own. See how at this link: http://www.wikihow.com/Make-Distilled-Water

2. We should go into section 3 ( Cultures) and read a little about Bactoferm and what it does. It’s at this link: http://www.wedlinydomowe....ausage/cultures
It’s not complicated, nor is it lengthy. I realize there’s been a lot of reading lately, but these are things you should have tucked away in your sausage savvy. I look at it this way: For centuries, man had no idea what was happening inside salami and certainly had no concept of fermentation due to lactobacilli. I’m just happy to be living in a time where we have the technology to understand such “saddlebum science” and craft better products because of it. We don’t have to memorize the names of the microorganisms or even learn how to pronounce them, but we should have a little knowledge concerning them so we’ll know what is happening inside the curing chamber. Let’s take advantage of the great information Stan Marianski has so generously provided (at no cost).

3. We should be finishing up the details on our fermenting chambers. Let’s test run them before we begin. For this particular recipe, we will not be using the heaters in your new fermenting
cabinets. Later on, making a fast-fermented sausage, you may need to heat the chamber as high as 115˚ F.

4. Soon, we should read section 4 so we don’t end up poisoning ourselves. It is called “Safety Hurdles” and is at this link: http://www.wedlinydomowe....safety-hurdles

Can someone suggest a time schedule for these items? We can go as slow or as fast as your schedules permit. In my opinion, it doesn’t make much sense to be “rushing without reading”. Any way you look at this project, we’ll be eating “long-term, fully dry-cured, southern European style” Salami Alysanndra about the middle of September.

Best Wishes,
Chuckwagon

Dave Zac
Posted: Fri Jun 17, 2011 13:57

I'm ready and anxious to go. But, if the group consensus demands, I will wait.

I am having trouble getting humidity up, but as Ross explained, perhaps with more than a frozen bottle of water and small pan of salt and water I will be successful.

Dave

ssorlih
Posted: Fri Jun 17, 2011 15:19

After I get my racks in place I am going to hang wet towels from hooks on the racks. I can keep them wet for three days and then either allow them to dry or remove them.

On another note. Chuckwagon, I am always interested in connections. Making sauerkraut involves the natural fermentation of shredded cabbage with lactic acid producing bacteria. How do you like a connection of cross contamination between the sausage maker's lunch and the meat he was grinding? Just a little sauerkraut in the sausage mix would add the right bacteria for a start.

_________________
Ross- tightwad home cook

uwanna61
Posted: Fri Jun 17, 2011 18:15

Hehehe! Maybe if I schmooze the wife Saturday, then when she’s not looking on Sunday, I can make some salami! 😊
Quote:
Uwanna already had his curing chamber in place at the beginning of the project. How do you folks feel about getting started with the grinding and stuffing? Check in please
[/quote]

Yes my chamber is ready to go! I just cut a piece of Genoa salami last night made last April. Added some Cabot monetary jack and crackers, yum yum! The Genoa taste fine but I must confess, I did not use Protein lined casing, but will on project A./quote]

Chuckwagon

Posted: Fri Jun 17, 2011 22:20

Hi Guys,
It sounds like we're ready to go. Dave, how much humidity are you able to sustain? Did you put a tray of salt in the bottom and barely cover it with water? It should really make a difference. The more surface area, the higher the humidity will be. It will probably level off at about 75%. To bring it all the way up to 85-90% you may have to hang wet towels or do what I did - use a baby's room plug-in humidifier. I rigged it so it would start n' stop at adjustable levels. Controls for doing this are expensive and I had to mortgage a kid to get them. The ideal solution is to start at 90% and slowly, over the period of 72 hours, drop the humidity to 85%. This can be a challenge. If you can come close to 85%, you should be ok. Perhaps the wet towels plus the pan of salt water would do the job.
You may wish to hang a few wet towels over a pan of watered salt and test the humidity for a while before we start.

OK gang, we could shoot for Monday on the grinding and stuffing. I'd like to present some questions to you on Saturday or Sunday. Sort of a "self-check up" you can take so you can see if you are understanding the process. I'll give you the answers and you can correct your own quiz. No need to embarrass ourselves here eh? If you flubbed on one or two, we can discuss them with the group. Nobody will have to know how many or which ones you missed - not even me. Or... we can skip the "check up". It's up to you. Another option is to go ahead and grind & stuff over the weekend, then do the reading n' check up later in the week. Let's make this comfortable for you fellows. My schedule is pretty flexible these days. How about some suggestions for our timetable.

P.S. Hey Uwanna, I've got it 😊I've got it 😊Hmmm... sometimes I astound myself! 😊I could come over and schmooze your wife while you grind salami 😊She'll be sure to go for my great lookin' moustache. It's a babe magnet! I just have to fight off the females even at my age! 😊

Best Wishes,
Chuckwagon

jbk101
Chuckwagon,
Have another question(s) So here goes!

1.) What type of salt is to be used in the pan inside the curing Chamber? Can it be just good old Rock Salt that I use to melt the snow off my sidewalk in the Winter or does it need to be a food grade type of salt?

2.) How much is recommended to start out with. I'm sure it will depend on the area your in and what the relative humidity is but I am looking at a ballpark recommendation!

3.) Will a ph meter and an Aw meter be needed during this process or are they just luxury items (wish list for future endeavors)?

So far that’s all that comes to mind.

Dave Zac

Chuckwagon wrote:
Hi Guys,
It sound like we're ready to go. Dave, how much humidity are you able to sustain? Did you put a tray of salt in the bottom and barely cover it with water? It should really make a difference. The more surface area, the higher the humidity will be. It will probably level off at about 75%. To bring it all the way up to 85-90% you may have to hang wet towels or do what I did - use a baby's room plug-in humidifier. I rigged it so it would start n' stop at adjustable levels. Controls for doing this are expensive and I had to mortgage a kid to get them. The ideal solution is to start at 90% and slowly, over the period of 72 hours, drop the humidity to 85%. This can be a challenge. If you can come close to 85%, you should be ok. Perhaps the wet towels plus the pan of salt water would do the job.

You may wish to hang a few wet towels over a pan of watered salt and test the humidity for a while before we start.

I was only getting to 65%. I noticed as my temp went down, so did the humidity. I will use more salt and less water covering it in a larger pan, together with some towels. I'm hoping that when I line the wood box with Press n Seal that may help with humidity too.

Quote:
OK gang, we could shoot for Monday on the grinding and stuffing.
Um, as much as I would love being home during the week, I gotta work I could cut and be ready to grind and stuff Monday night probably. My preference is over the weekend though. Sunday is Father's Day so I get to do what I want.
Hi John,
Great questions.
The reason we use salt is to keep the water from developing slimy, nasties that go sour. I used plain ol’ table salt before I got a fancy-schmancy, humidity-controlled unit with flashing lights that also washes the dishes, tends the kids, and figures out the income tax! 😅 I’m sure good ol’ rock salt would be fine as long as it doesn’t contain other snow-melting ingredients. I realize it’s not pure, but after all, it’s not going INTO the sausage in any case. Put about a pound of it on a lipped cookie sheet or you can even put a little more into a shallow plastic 10 x 12” lug. Barely cover the salt with water. At the minimum, this will give you > 70% humidity right off the bat. Add water as needed over the curing period and watch the hygrometer.

The reason we have so much moisture up front during the fermentation phase, is that bacteria just love water. In the meat, ALL bacteria just thrive – the good AND the bad. Without the salt in the recipe, the bad guys would win out. The salt “binds” their available water supply and allows the good guys to receive nourishment and multiply. As we drop the humidity, the meat begins to dry out slowly. When it drops below Aw 0.85, bacteria is no longer a threat and the meat is ready to consume.

Additionally, we add a lactobacilli to produce lactic acid. This is secondary insurance. As the pH drops and the acidity increases, the pathogenic bacteria are no longer able to survive and again…the sausage becomes safe to consume. Think of all the products we eat that are pickled in vinegar. They are safe because of the acidity.

Most home producers do not use the “Pawkit” because it costs about three hundred bucks – last I checked. Most folks gauge the finish by the loss of 30% weight. This is the reason it is important to weigh the salamis just before they go into the curing chamber. This is their “green weight”.

To test the pH, many folks use a small strip of cheap litmus testing paper dipped into a mixture of 1 part finely chopped meat with 2 parts distilled water. The color of the paper is matched on a chart telling us how much acidity we have achieved. You can see what they look like at this link near the bottom of the page: [http://www.wedlinydomowe.....usage/equipment](http://www.wedlinydomowe.....usage/equipment)

However, most people I know, even skip this test and depend wholly upon the 30% weight loss and their taste buds to “pull” the sausage. I like to remind folks that the test of the proper acidity is not in the length of time it has been in the chamber, but the actual measurement of pH in the product. The “Hanna” professional testing kit is also so expensive that most home producers do not purchase one. On the other hand, litmus paper testing strips are available in rolled lengths of 15 feet for $12.99 and a roll of it will last a home-producer a very long time. It’s available through most suppliers in a dispenser with a color chart on its side.

Good goin’ John. How does your timetable look? Are you getting ready to grind?

Best Wishes,
Chuckwagon
Hi Dave,
You wrote:

"I'm hoping that when I line the wood box with Press n Seal that may help with humidity too.

I thought you had the lining in. Yes, you can bet a dollar against an inside straight that the humidity will climb with the plastic sheet in place. (The bare wood is absorbing water) I would even paint that wood with epoxy paint when you have a chance after this batch is removed. Then you may wish to use a removable plastic even then, to simply throw away the mold.

Remember, sometimes, in some recipes of northern Europe and the U.S. etc., mold is not used and smoking deters the formation of bad molds. We MUST avoid any green colored mold if it develops. It can be removed with a little salty vinegar solution on a towel.

Ya know, in America, people prefer smoking as a bad mold deterrent rather than forming a penicillium white mold. In the San Francisco area, for some reason, it is far more popular to develop plenty of white mold on salami.

Should we plan on grinding and stuffing on Sunday then? Sounds like Uwanna could do it then as I will have his wife out to dinner and a picture show! 😄

I believe Ross is ready to go and JBK also. Even if we can't get together on the exact same day, we'll be alright. I would like to have everyone's sausage in the fermentation chamber by about Wednesday or Thursday to keep on a similar drying timetable.

Dave, I believe you're going to have a long July and August, with your drooling tongue hangin' out! ha ha 😄Shucks pard, mark my words, the time will actually shoot by and we'll be tradin' photos all over the place.

Best Wishes,
Chuckwagon

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I can be ready to grind Sunday. Working has been taking up a lot of my time. Tomorrow we want to get the boat ready to launch on Monday. But that should that less than 4 hours. My next imperative is making the sticks and installing the racks.

Ross- tightwad home cook
Chuckwagon
I’m not sure if you could schmooze her any more than I, including with the moustache. 😊 When I’m grinding she tends to find something to amuse herself. My wife reads and writes, book worms are in their own world, in this case lucky for me 😊

On another note: just made 10lbs of venison pepperoni, mixed and in the fridge, ready for the smoker tomorrow. Need to clean the venison out of the freezer!

As for the start date, I will keep in touch over the weekend, to review the notes, and shoot for Sunday evening, or at the latest Monday evening for grinding and mixing.

partycook

Hi Chuckwagon,
Sorry I have not responded to your emails although I have been keeping up with the site as far as doing my reading. I am currently in the process of helping my grandson with some remodeling on his new house,(removing walls etc). I have previously made a fermenter from a old freezer, I have also built a digital controller to regulate my temperatures. I use a ultrasonic humidifier and a Green Air for controlling my humidity. I have also built a curing cabinet from an old refrigerator and have purchased a controller for controlling the temperature. This unit also has a computer fan and a variable voltage supply for controlling air speed. I know I am a bit ahead as far as some of the equipment I have.

I would have enjoyed building a box unit and experimenting with different ways of controlling temperature and humidity but due to these other obligations I just don't have the time to build a unit.

Party Cook
John

Chuckwagon

Hi Partycook,

You wrote:

Quote:
I have been keeping up with the site as far as doing my reading.

Good to hear from you. Sounds like you’re pretty busy. It also sounds like you’ve got a real handle on your fermenting and dry-curing chambers. Old refrigerators are terrific for this
purpose and I’m sure yours will do just fine. Have you used them quite a bit before, or are you just starting into the fermented type sausages? What are your thoughts about the recipe we’re using and about our time schedule? I think the guys are ready to grind and stuff this weekend and get them into the fermenting chambers they’ve made. Once we do that, we can concentrate a little more on some of the reading and get into some good discussions. Keep in touch John.

Best Wishes,
Chuckwagon

uwanna61
Posted: Sat Jun 18, 2011 14:38

Chuckwagon

As for the recipe “Salami di Alessanddra” on the optional note is an alternative to the above recipe, can you explain? Do we add what ever seasoning meets our fancy from the optional to the above recipe? Also, the recipe calls for sugar, is this table sugar?

I never had any luck fermenting salami with wine added to the recipe! I believe this may be the reason my last pepperoni batch went south, probably among other things. Like I mentioned in my last post, I made fermented Genoa salami this past April, and with the exception of not using protein lined casing it came out pretty good. I also used simple seasoning like white pepper, salt, and dextrose, but the bactofirm was the LHP, the cure time with 2.5” casing took about 2 months. If I had used the protein casing it would have come out perfect.

I put on my mustache and schmoozed the wife last evening, with a picture show.

ssorlih
Posted: Sat Jun 18, 2011 16:16

I have been working with and on my fermentation chamber this morning and discovered that salt water had escaped from the swamp and gone wandering. Be aware that this can happen and either watch for it or make a big plastic tray for the chamber.

Ross- tightwad home cook

partycook
Posted: Sat Jun 18, 2011 19:09

Hi everyone,
I'm in the process of doing a dry run on my temperatures and humidity levels. I was wondering what you guys would suggest as a final rinse after washing the fermenter/cureing chamber and tools with soap and water. I know some folks that use a diluted bleach solution. I have tried this and it seems to leave a bleach odor, or am I mixing it to strong? I also would like to know if a fan is needed in my fermenting chamber (freezer 22 cu. feet)? I guess I worry about food safety. I
had a party last year and a friend brought a dish to pass, 12 people got sick. It took the health department weeks to figure out what the source of the food poisoning was.

John

Dave Zac

Posted: Sat Jun 18, 2011 22:17

partycook wrote:
Hi everyone,
I'm in the process of doing a dry run on my temperatures and humidity levels. I was wondering what you guys would suggest as a final rinse after washing the fermenter/curing chamber and tools with soap and water. I know some folks that use a diluted bleach solution. I have tried this and it seems to leave a bleach odor, or am I mixing it too strong? I also would like to know if a fan is needed in my fermenting chamber (freezer 22 cu. feet)? I guess I worry about food safety. I had a party last year and a friend brought a dish to pass, 12 people got sick. It took the health department weeks to figure out what the source of the food poisoning was.

John
This close to fermentation I would use only hot water and soap. I would hate to mess up this beautiful process with a little bleach.

I got my chamber lined with Press n Seal early this afternoon. First check 4 hours later my humidity has zoomed to 90% 😅I'm ready

ssorlilh

Posted: Sat Jun 18, 2011 22:40

If we can use vinegar to wipe the mold off the sausage why not use vinegar to clean the chamber walls? A little acid and a little salt should make the walls clean enough for the next batch. Hydrogen peroxide and baking soda is also an effective cleaner for bacteria.

Ross- tightwad home cook

partycook

Posted: Sat Jun 18, 2011 23:13

ssorlilh wrote:
If we can use vinegar to wipe the mold off the sausage why not use vinegar to clean the chamber walls? A little acid and a little salt should make the walls clean enough for the next batch. Hydrogen peroxide and baking soda is also an effective cleaner for bacteria.

Yes I have heard that peroxide works well against bacteria. When I worked in the brewery we used chlorine inside the fermenters and all the hoses were rinsed with an iodine solution before we added yeast.

John
This is just a bit off topic but must be noted. The book, "Home Production of Quality Meats and Sausages" contains much of the material in "This Web site":
http://www.wedlinydomowe....es/ham-sausage. But I found an error of omission in the referenced recipe. In the book Cure #1 is included but it is absent in the recipe on the web site. I have contacted the authors and made note of it. This is a fairly new web site and such errors can be expected. If anyone finds something that doesn't seem right it should be brought to light for discussion and possible correction.

Ross- tightwad home cook

I spent a little time closing seams and joints in my workmanship on the chamber. I am becoming convinced that this needs to be rather air tight and we must have control of the ventilation and not leave it to chance. If you have built your chamber and have difficulty with control I think that caulking the seams and joints would be a first step. Nature tries to restore a balance in all things. When we build a chamber such as this we are creating an environment that is not normal. All of the forces of nature will try to balance the temperature and humidity inside with the temperature and humidity outside.

Ross- tightwad home cook

Hi Guys,
I hope everyone is aware of the conversion page we have at our disposal. Here is a link:
http://www.wedlinydomowe....cure-calculator

Uwanna wrote:

Quote:
Do we add what ever seasoning meets our fancy from the optional to the above recipe? Also, the recipe calls for sugar, is this table sugar?

We can add 7 grams of any spices you’d like to put together and 4 grams of your favorite herbs. Not everyone likes the same flavors of certain herbs and spices, so we are given an option of using any combination as long as 7 grams are spices, and 4 grams are herbs. The sugar in the recipe is good ol’ table sugar.

Uwanna, your Bactoberm™LHP is completely on the other end of the scale from the slow T-SPX we are using. The LHP is considered to be an “extra fast” culture and can drop a sausage to
pH 5.0 in only 2 days! When this happens, the pediococcus acidilactici and pediococcus pentosaceus leave a very pronounced sour flavor behind. It is also fermented at 100° F. (32° more than our recipe using T-SPX). For pizza pepperoni, that kind of “tang” is alright for me, but in a salami… I’d suggest we go for the full-flavored, long-term, southern European style Genoa Salami called Alysanndra. I really do like your idea of using only a bit of white pepper, salt, and dextrose, however. That kind of treatment could only make it yummy good. As you probably know, old timers will always tell beginners that they tend to use way too many spices, but it seems like ALL beginners must learn that lesson the hard way. At least I did.

Best Wishes,
Chuckwagon

Chuckwagon Posted: Sun Jun 19, 2011 09:00

Our buddy Partycook wrote:

Quote:
I was wondering what you guys would suggest as a final rinse after washing the fermenter/cureing chamber and tools with soap and water. I know some folks that use a diluted bleach solution. I have tried this and it seems to leave a bleach oder, or am I mixing it to strong?

Unless you’ve previously had a problem with mold build-up in your fermentation chamber, it should be clean enough with just good ol’ soap and water. If you’ve had traces of any “colored” mold, go ahead and use a mild bleach solution if you are using a porcelain or plastic surface. Rinse it well. After that, rinse it well. Then before you put any meat in the thing, rinse it well. 😃 A few years ago, after a stint in the hospital, I came home only to discover that some bad mold had started and I thought I’d never get that crap out of the fermentation chamber (it has a white plastic interior). I finally had to scrub it out using a little mild vinegar-water solution. After a day, with the door open, I used a little Pine-Sol and water and rinsed it very well. The next time I made salami, the good ol’ white penicillium nalgiovense took over again and crowded out anything else.

Partycook also wrote:

Quote:
I also would like to know if a fan is needed in my fermenting chamber (freezer 22 cu. feet)? I guess I worry about food safety. I had a party last year and a friend brought a dish to pass, 12 people got sick. It took the health department weeks to figure out what the source of the food poisoning was.

Your fermentation chamber should absolutely include a fan. Read back through the previous posts in this particular forum for that information. We will start out by removing air at about 2.2 MPH and drop to just a little over 1.5 by the end of 72 hours. Also be aware that during this time, the temperature is dropped slightly also.

Oh, and Uwanna commented about using wine in his sausage. I agree with him that it is perhaps best to just leave it out. The stuff denatures proteins (unravels them) and causes a loosening of
the texture somewhat. You must remember that this is an old Italian recipe and those folks put wine in everything. I’m married to one and so are all my siblings! Italians are great people and good ol’ burgundy is fine… in the spaghetti sauce! Just as a recommendation, I’d leave it out of your first batch and try adding a little later as you become more experienced. Never, never, ever… use a “cooking wine”. That stuff is so full of salt it will ruin your salami. I wouldn’t even use that crap to put out a good campfire!

Best Wishes,
Chuckwagon

Ross wrote:

Quote:
I spent a little time closing seams and joints in my workmanship on the chamber. I am becoming convinced that this needs to be rather air tight and we must have control of the ventilation and not leave it to chance. If you have built your chamber and have difficulty with control I think that caulking the seams and joints would be a first step.

Ross, ol’ buddy, I’ve been chuckling for a couple of hours. Seems, you have learned something the hard way. Yes, it must be “rather air-tight”, or at least “fairly” air tight. Enough so there’s not an “ingress” of uncontrolled air. In a wooden cabinet chamber, this could be a challenge. Silicone caulking is a good idea.

Let’s look at what we are attempting to do with our “fermentation chambers”. We are going to purposely spoil meat… but it will be controlled spoilage called fermentation. Many foods are prepared in such a manner. And what causes this “spoiling”? Bacteria. In meat, we use lactobacillus and pediococcus, feeding on sugar (carbohydrates) to produce lactic acid. This bacteria competes for nutrition with the undesirable spoilage bacteria (brochotrix thermosphacta and pseudomonas spp.) et. al., as well as pathogenic bacteria of several varieties. Of greatest concern are staphylococcus aureus, clostridium botulinum, listeria monocytogenes, escherichia coli, salmonella, clostridium perfringens, campylobacter jejuni, shigella, and bacillus cereus.

What makes these bacteria safe when consumed in meat, cheese, or any fermented food? Acidity! Bacteria do not do well in an acidic environment. In meat, lactobacilli produces acidity and when it increases, dropping to a point between 3.8 and 5.5 on the pH scale, it becomes safe to consume. The acidity of a sausage is determined by the amount and the type of sugar placed into the recipe. The speed of the fermentation period is increased as the temperature is increased inside the chamber. It ceases when no more lactic acid is produced. This happens when there is no more sugar available to the lactobacilli. It will also stop when the temperature is lowered below 53˚ F., or heated beyond 120˚ F. Fermentation will also discontinue when there is no longer free water available to the lactobacilli. In other words, if the sausage dries too quickly due to either (a.) low humidity, or (b.) too fast an air speed, while in our fermentation chambers, fermentation will cease. We must also remember to use a specific amount of nitrate/nitrite to
combat any possible *Clostridium botulinum*. The toxins of the spores are deadly. Measure carefully.

OK wranglers, while the increase in acidity is taking place, we must contain the growth of the pathogenic and spoilage bacteria somehow (while the *lactobacilli* go to work). The most convenient method is to simply lock up or “*bind*” their water supply. This is accomplished by the use of salt, and a prescribed amount will bind their reserve. As the “*water activity*” drops to a point below Aw 0.86, a meat product has dried enough to consume safely.

You may be wondering why the salt doesn’t affect the lactic acid-producing bacteria also. Well, it does… but not to the same degree. *Lactobacilli* and *pediococci* are somewhat resistant to salt. Not only that, but they perform rather well having a limited water supply.

Summing it all up, we allow the sausage to ferment as lactic acid microorganisms go to work producing acid. This is where we get the “tang”. When it reaches proper acidity, it become safe to consume. While this is happening, we also start drying the sausage to achieve a point below .86 Aw. All this takes time… time in which pathogenic and spoilage bacteria may also grow in number by competing with the food supply. As we “bind” their supply of water, they start to die and the beneficial bacteria eventually take over. So… in essence, there are TWO things going for us. *Acidity* and *dehydration*. Both work! They’ve worked for thousands of years. But they MUST be controlled.

OK guys, it’s time to start grindin’ and stuffin’. Please obey all the rules of cleanliness, cover your hair, and don’t cough! **Wash and scrub your hands**! Good luck and I’ll check in with you in about 12 hours. 🤚

Best Wishes,
Chuckwagon

**Dave Zac**
posted: Sun Jun 19, 2011 20:32

Well, here we are. This is my son holding our baby! He helped my stuff and has always had a growing interest in sausage making and self sufficiency.
Hanging and ready to close the door for the day. Oh yeah...while I was grinding, mixing, fermenting and curing, I decided to do a Spanish chorizo too. (Hanging on left) er bottom...I'll be darned if I can get this image to display correctly.
Did you remember to record everything in a notebook? Write down every little possible detail you can remember. You won't believe how handy this info will become later on. Hey, that's a mighty handsome buckaroo holding the salamis. My wife thinks he's "adorable". That's a word old folks like us use for other people's youngsters! 😄

Did he help grind and stuff?

Hey Dave, I've got your photo trouble figured out. Just hold your camera at a 90 degree angle next time! 🤣Har, har, har! That's terrific work Dave. Now, could you explain what you did and also what is happening inside the chamber if someone were to ask you?

Keep up the good work pal!

Best Wishes,
Chuckwagon

I have my meats and fat ground but ran out of time, energy, and enthusiasm. Because variety is the spice of life and because Longaniza, slow fermented Pepperoni and Genona Salami all have the same curing schedules I have decided to make two kilos of each instead of five kilos of salami. Will mix, season, and stuff tomorrow.

Ross- tightwad home cook

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Did you remember to record everything in a notebook? Write down every little possible detail you can remember. You won't believe how handy this info will become later on. I will spray tonight

Quote:

Hey, that's a mighty handsome buckaroo holding the salamis. My wife thinks he's "adorable". That's a word old folks like us use for other people's youngsters! 😄 Did he help grind and stuff? He did help. He loves this stuff too!

Quote:
Hey Dave, I've got your photo trouble figured out. Just hold your camera at a 90 degree angle next time! 😁 har, har, har! That's terrific work Dave. Now, could you explain what you did and also what is happening inside the chamber if someone were to ask you? Yeah I'm pretty sure I can explain it as far as I understand it...great teacher of course.

Next question. As of 6:15 am (eastern time) and only 16 hours after hanging and I had my fan on 3 MPH best I can tell. Humidity can't seem to get above 82% and the outside of the casing is bone dry. Seems too dry to me and now I worry about case hardening of course. I re soaked some towels and turned the fan off this morning to what happens when I get home from work. Bad idea?

Chuckwagon

Posted: Mon Jun 20, 2011 23:47

Geezee Ross, So far in the last couple of days you’ve only transported and launched your boat, corrected a few recipes, fixed a leaking fermentation cabinet, answered lots of mail, learned all about fermented sausage and ground ten pounds of it. I just can’t imagine the reason why, at age 72, you’ve “run out of time, energy, and enthusiasm”!

Oh, and Dave, I’ve been runnin’ around with too few zzz’s. AFTER the fermentation, wipe away the moisture on the sausages, THEN spray them with Bactoferm Mold-600. If you’ve already done it, don’t worry about it. There is actually no incorrect method or bad time to do it if you are using the same chamber for drying as you are for fermenting. The critical thing to remember is that we need at least 75% humidity for mold to grow.

Dave also wrote:

Quote:
Next question. As of 6:15 am (eastern time) and only 16 hours after hanging and I had my fan on 3 MPH best I can tell. Humidity can't seem to get above 82% and the outside of the casing is bone dry. Seems too dry to me and now I worry about case hardening of course. I re soaked some towels and turned the fan off this morning to what happens when I get home from work. Bad idea?

Bad idea? Not at all, Dave. The most critical thing in the fermentation chamber is to provide a warm, humid atmosphere for the bacteria to multiply. This early into the fermentation period, ALL bacteria are multiplying and competing for the available water. It is the salt that is binding the available water to the pathogenic bacteria and keeping them from multiplying while the lactobacilli go to work.

Yes, you can case harden it if there is too much air speed. Turning off the fan is fine and even advisable in order to boost the humidity to nearly 90%. Now is the time we want a full egress of moisture through evaporation (watch your hygrometer and try to keep it above 85%). However, the surplus must be vented to the outside somehow or you’ll have a big wet mess. At long intervals of even half a day or so, you’ll probably want to run the fan for just a few minutes. Some people open the doors each day and fan the air out with a magazine or newspaper. Now you can see the value of automatic controls eh? Don’t worry, after the fermentation period, the
drying won’t be so intense and checking it once a day will usually suffice. Hang in there dude! Oh, by the way, what is your son’s name? It’s always nice to have some help eh?

**22:38Hrs.**

Davezac brought up a very important point that we should be aware of at this stage. He stated that his sausages were dry in the fermentation chamber. I advised him to turn off his fan. I’d like to explain why it is proper to turn off the fan if no moisture is detected on the sausage’s surface. *(Dave: Please check your humidistat and let us know how much humidity you have in the chamber at this point.)*

Remember, the purpose of fermentation is to increase the acidity of the meat in order to increase its microbiological safety. It does not make it taste better. In contrast, it develops a sour flavor, increasing the growth (number) of bacteria as the meat is warmed. Moisture is needed to nourish the lactobacilli and pediococci. If you’ve ever seen the production of sausages in a commercial plant, you’ll have noticed that chopping, grinding, mixing, and stuffing, all take place at 0˚C. This is only about a degree or two above the freezing point of meat. When the sausage is removed to a much warmer fermentation room having a temperature anywhere from 68˚ F. to 105˚ F., condensation is sure to develop. To avoid condensation on the sausages’ surfaces, it is placed in the fermentation chamber at room temperature, with an initial low humidity of only about 60%, and no air speed. Depending upon the diameter of the sausages, the duration of time varies from merely an hour to six hours. It is important to note that in this level of low humidity, if a draft of air were introduced, case hardening could possibly become a problem as unnecessary drying might take place until the humidity were raised. Any case-hardening at this point, would certainly affect the fermentation AND the ensuing drying process. So, while the sausage is in the fermentation chamber, use the fan only if there is moisture on the sausage. As the fan removes the excessive moisture, simply click it off. Whew! What a pain in the… uhhh… neck. Now you may see why folks use electronic controls.

Best Wishes,
Chuckwagon

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Hey all

Di Alessanddra stuffed and in the curing cabinet (fridge). I could not do the 72 hr fermenting in my smoker due to the temperatures here, night time lows 45 -55 and day time in the low 80’s. So I finished stuffing and in the chamber (fridge) they went. So far I feel pretty good about the grind, mix and stuffing. The chamber is holding at 85-90% humidity and the temp is spot on at 68 degrees.

Chuckwagon

I have a major itch to make a dry cured pepperoni, in the upcoming days 😊 and would like to add a second batch to the chamber (fridge). Would it be safe to dry cure another batch of salami (pepperoni) in the chamber along with the Alessandra, after the pepperoni ferment process is complete? I was just concerned with cross contamination; I suppose that could happen anytime,
if one was not careful. I’m just not sure if I should add another batch, during the curing process, and if it would disrupt the first (alessandra) salami.

uwanna61
Posted: Tue Jun 21, 2011 00:53

Ok, so I lost my salami production photos, camera / PC issues. Anyhow I took a few snap shots of the curing chamber, which is fermenting at the moment, I hope! I also and logged into photobucket for the first time and lets see how this works 😎
Hi Uwanna,

Chuckwagon
Wow, it sounds like your fermenting chamber is working just fine. I had that same major pepperoni itch too. That’s why I posted “Project P” with T-SPX and Mold-600 in the same forum (Microbiology Of Meats). It has the same specifications. If you get the pepperoni right into the fermentation chamber, I believe you’ll be ok. Avoid a sudden drop in temperature and humidity if possible. I wouldn’t worry about ‘cross contamination’ as much as maintaining the constant humidity and temp. Go for it! Note that with different diameters of sausage, you’ll have different finishing times. Be sure to weigh the sausages and keep good notes. Watch for the smaller diameter to finish first with a weight loss of about 30%.

Best Wishes,
Chuckwagon

uwanna61

Posted: Tue Jun 21, 2011 17:58

Will do! Thanks for the advice.

ssorllih

Posted: Wed Jun 22, 2011 05:54

Hanging in the curing chamber are two kilograms each of Genoa Salami, Longaniza, and pepperoni. In one pound links.
It was a bit of a jigsaw puzzle to put it together but for this much effort I thought why not add some variety to my life. The cure/dry schedule is the same for all three.

Ross- tightwad home cook

Chuckwagon

Posted: Wed Jun 22, 2011 06:41

Sounds like a plan Ross. Which type of casing did you use? Are you holding firm at about 90% humidity and 68 degrees F.? And watch the air speed. If you see dry casings tomorrow, cut back on the 50 MPH Gale force winds going through your FC.
Goodness, I’m like a dad worrying about his kids out on their first date! 😄 Have patience with me fellars.

It looks like SikaStag is going to wait until his deer season opens in the fall. Rand is going with Project P (Pepperoni). GrayGoat has computer problems. We still need PartyCook and JBK to check in. Last we saw, JBK had a beautiful fermenting chamber built with a fan and a nice hygrometer-thermometer unit. I know he's got his hands full at work, so he might be a day or two behind the speedsters Uwanna and Davezak in getting their meat ground and stuffed. Oh shucks, then there's that big show-off Ross (ssorllih). He's makin' three different sausages to make us all jealous! It would serve him right if everyone showed up hungry on his porch about September 15th eh? 😁

Best Wishes,
Chuckwagon

ssorlilih


Used clear fiberous protein lined 2.4 inch casing from The Sausage Maker in Buffalo. [http://i1112.photobucket....0001resized.jpg](http://i1112.photobucket....0001resized.jpg)

Ross- tightwad home cook

Dave Zac


Lookin' good Ross. I'll be testing the same Cranberry juice bottle tonight to see how that size brings the temp down. Does it get it low enough for you? I have a 1 gallon milk jug frozen in reserve

ssorlilih

Posted: Wed Jun 22, 2011 17:44

Dave I can get down to 68 degrees with one jug of ice but the one you see is water, the ice is under a wet towel. The jug of ice pulls humidity from the air and I need all of the wet towels I can spread. More surface area will provide better cooling, more volume will last longer. Friday when I start dropping the temperature I may go to two exposed jugs at a time. I have many.

Ross- tightwad home cook

Dave Zac


When can I expect to see mold growth? It's only been 36 hours but I wonder when I will have to consider another spray.

uwanna61


Hey all

I do have one question on the bactoferm 600 mold and this is my first use of this product. Per the instructions, it says to add 3 grams of the 600 to a cup of 68 degree warm chlorine free water, and hold for 12 hours. Then add 1 liter of chlorine free water, after the 12 hours. My salamis are ready for a mold 600 bath (dip) this evening. Shall I wait for the twelve hours or would six hours do? The next chance I will have to give them a bath (dip) will be tomorrow late afternoon, which will put me out to around 24 hours. I’m thinking I should have done this in the beginning when the Salamis where 1st hung, during the fermentation process. Maybe I will roll out of the rack early in the morning, before work and dip them then 😊
Chuckwagon
Are you starting to feel like a salami grampa, waiting for all the little salamis to mature 😊

Chuckwagon 🧀
Posted: Thu Jun 23, 2011 02:35

Hi Uwanna,
I would wait the full 12 hours, add the liter of water, then dip. This time is called the "lag phase" and is necessary for the penicillium nalgiovense to wake up. Shucks pard, if you were cryogenically quenched like the Bactoferm, you'd want to warm up a little too before you went to work! 😊 Whether you dip or spray, or add it during fermentation or drying, makes little difference. This stuff grows so quickly and full, you'll be amazed with the powdery, flaky, white stuff. It done correctly, you'll have mold all over everything. The *penicillium nalgiovense* bacterium literally crowds out the colored bad stuff. However, if you happen to see any green or off-colored mold, especially if it is “fuzzy”, wipe it off with a moist towel dipped in a vinegar-salt solution, then spray on a little more M-600 mixture. Always mix a new batch for a new batch of sausage.

Best Wishes,
Chuckwagon

Siara 🧀
Posted: Thu Jun 23, 2011 12:41

Hi smoke addicts ,

I’m so impressed with what you do here.
At the same time I’m sorry I do not have time to join You in this oddsome projects.
We are lucky to have our buddy CW to provide us professional support.
Please post photos, they will be very helpful for newbie’s who will follow this project in future.(also for me 😊)

"W życiu piękne są tylko chwile"
Pozdraswiam
Siara

Chuckwagon 🧀
Posted: Thu Jun 23, 2011 13:04

Hello Siara old friend!
We hope you are doing well. Have you finished your work project. Did everything go smoothly? Thanks for the kind words Siara.
Question: When I click on Wedzarnicza Brac (Wedlinydomowe.pl) and the homepage comes up, who is the man in the photo next to all the delicious sausages & meats? Is that Maxell? The guy in the photo is a handsome fellow, but awfully thin! I pictured Miroslaw Gebarowski about 100 pounds heavier! 😊
Is your photo anywhere on the site?

Best Wishes,
Chuckwagon

ssorlíh Posted: Thu Jun 23, 2011 13:59

My chamber is running about 64 degrees and 90 % RH. This is on the low side for the fermentation temperature by about 6%. Shall I just allow a few more hours for fermentation before I start reducing the temperature and RH? I am about 36 hours in at this stage.

Ross- tightwad home cook

Chuckwagon Posted: Thu Jun 23, 2011 14:14

Good morning Ross and Dave,
64 degrees at 90% is perfect! Don't do a thing. (Except sail that boat).
Dave just emailed me and said he is having a hard time keeping the temp down to 68 degrees.
Will you tell him a few of your secrets Ross? How are you maintaining that temp?
I use a line voltage thermostat from McMaster-Carr (www.mcmaster.com)
Dave will be alright with the fermentation at that temp but after the 72 hour mark, he'll have to drop it another 10 degrees for almost 3 months.
Do you folks in the east have cool, damp, basements like we do in the west. My drying room stays about 60 all year around.

Come on back good buddies 😊Don't fret... we're not going to lose this batch.
Best Wishes,
Chuckwagon

Chuckwagon Posted: Thu Jun 23, 2011 17:41

Hi Guys,
At this point in our project, a small increase in temperature is not as critical as the rate of diffusion and evaporation. Without a starter culture it would be. A bit of temperature raise will not harm the lactobacilli. However, the staphylococcus aureus and micrococcaceae spp., begin to grow at temps above 60°F. These are the guys responsible for flavor (and color) and right now they must have Aw > 0.96. This is the reason we must not drop the available water down too quickly. They need a little water to work, but after another day, they should be just finishing up.
As we continue to lower the moisture gradually, we are drying the sausage from the inside out. This is called diffusion – the water moving from inside the sausage to the outer casing. When the water leaves the outside of the casing and is expelled into the atmosphere, it is called evaporation. Our goal is to balance the two, in a state of equilibrium.
If the *diffusion* rate exceeds the *evaporation* rate, moisture will collect on the exterior and create a slimy surface that will host unwanted yeasts and …yuck, colored, fuzzy, molds! On the other hand, if the rate of *evaporation* exceeds the rate of *diffusion*, the casing will dry out and harden. This “case hardening” will promote the growth of both pathogenic and spoilage bacteria, as moisture will have become trapped inside. Rytek Kutas used to say that it was just like welding the ends shut on a length of pipe. Could this case hardening become dangerous? Yes, possibly. The growth of pathogenic bacteria always presents a danger to our health. Remember, bacteria need water, and meat is 75% water. At the beginning of the “fermentation” stage, we want about 90% humidity and an airflow of < 0.7 m. per second to avoid case hardening.

Balancing diffusion and evaporation in this early stage of fermentation, has been known to drive sausage makers to the point of neuro-psychosis, where the use of foul and colorfully descriptive adjectives begin to affect their language, much to the consternation and dismay of their spouses. Soon, showing the first signs of “*noevapodiffusem*”, a victim will begin exhibiting bizarre behavior, including throwing rocks at the mailman and making obscene gestures toward politicians and newscasters! 😬Moreover, if this occurs during a full moon, one stands no chance at all! 😬

Have you ever cut open a salami and found a gray ring around the outer edges of the sausage? Years ago, I had to buy a salami because I was away to school. Not only did it have an ugly gray ring, it was sour as a dill pickle. It was beyond tangy and just a bite of it would put a frown on a lottery winner’s face! This is case hardening.

Once the lactic acid bacteria have done their job (creating enough acidity that bacteria cannot survive), more moisture can be removed at a little faster pace, but remember… a large diameter salami should dry at a slower rate than a skinny little pepperoni.

Wanna hear something crazy? As the pH becomes more acidic, the drying becomes less difficult. Why? Because the myofibrillar proteins (remember *mosin* and *actin*?) are losing some of their binding quality at this point. During the last week, the air speed should have been gradually slowed to only about one and a half miles per hour. However cowboys, that is over another horizon yet. Right now, we’re concentrating on *equilibrium*. Do what you can to balance the *diffusion* and the *evaporation*. Good luck buckaroos! 😃

Best Wishes,
Chuckwagon

**partycook** 😃
*Posted: Thu Jun 23, 2011 22:29*

Hi fellow sausage makers,

I tried to do a post yesterday and it didn't send. Well I managed to get my salami stuffed and into the fermenter on Monday. Temperature has been holding at 68 and the humidity is at 90 per cent fan speed at about 1/3 of full. I am going to go down and spray dip the mold culture a bit later tonight.
Hi Dave, my chamber is foil lined and plastic film covered one inch foam. Today I have two 3 litre bottles of ice and melt water in there. The box is pretty nearly air tight except for the door which fits very well. There is a two inch fan that blows at about 6 MPH at the fan, when you get a little away from it you can hardly feel in on your hand. My box is about 32 inches tall and 24 front to back and 22 from side to side. It came out that way as the best cutting for a 4x8 sheet. I suggest that you feel the outside of your chamber. If it feels cold or cool get some sheet foam insulation and paste it to the outside. I figure that opening the chamber a couple of times a day is more than enough ventilation. I sprayed a mist of water on the insides and it evaporated in about 18 hours. The sausages feel like a healthy, cool to chilly baby's leg. Rather silky but not dry dry.

Ross- tightwad home cook

Hi guys,
Ross' avatar says "passionate", and I believe it! He wrote,

"The sausages feel like a healthy, cool to chilly baby's leg. Rather silky but not dry dry."

Can you imagine what someone would be thinking if they were just tuning in? 😊 Ross, that description couldn't be more welcome. It means "equilibrium" is being achieved! Good, good, good!

Partycook! Nice to hear your news. Keep it up. It sounds like you're well under way. Did you remember to write everything in your log book? Records times, dates, activities, temps, and humidity. And be sure to keep an accurate count of the hours during fermentation. Tonight as you go to spray the M-600, note the condition of the surface of the sausages. The casings shouldn't be too wet, but not bone dry either. Once the mold begins, you can relax just a little.

Just think hombres! In just a few short weeks, you'll have a few hundred bucks worth of genuine southern European Allysandra. 🥴

Best Wishes,
Chuckwagon
CW should I be seeing any sign of the mold yet? My experience with mold spores is that they are harder to eliminate than to introduce. And another question, is this the same mold used on Brie cheese?

Ross- tightwad home cook

uwanna61
Posted: Fri Jun 24, 2011 03:44

Hey all
Thought I would report in. All looks good. Temperature holding at 57 degrees, humidity is stable, if I don’t open the door! Humidity here on the east coast is up and expecting rain the next few days. Perfect fermenting weather for the project P, which I finished this evening. Below is a photo of day four from project A. Dipped the salamis (project A) this morning before work. The salamis actually had white mold on them before the dip! It was exciting to see mold, hopefully I’m doing something right.

So far here are a few tips I have learned/picked up since joining this site:

1. Mix all ingredients with meat well. (Started using my 25lb hand crank mixer I bought a few years back, from Cabelas. Works much better than mixing by hand).
2. Meat temperatures (keep meat cold as possible)
3. Use cracked pepper, instead of store bought! Much better flavor!
4. Fermenting time (Other recipes I have followed recommended 24 hour fermenting time for the same or similar recipes I have created this past week).
Below I included a photo of my project A, can’t wait to try a bite!
Hi Uwanna. Hey dude, until you surpass the 75 hour fermentation period, you may wish to *raise your temperature by ten degrees*. As you go into the drying phase, then it will be fine to drop it back down to 57. Right now, the *micrococcus* (now called *kokuria*, by the way) and *staphylococcus xylosus* or *staphylococcus carnosus* need to have the temperature just a bit higher to develop *color* and *flavor*. This is very important in this stage of the fermentation.

How is the balance of "*equilibrium"? Are the *diffusion* and *evaporation* balanced? If you have extra moisture on the casings, increase the air speed just slightly.

Let me know how its going Uwanna.

Best Wishes,
Chuckwagon

*Chuckwagon*  
Posted: Fri Jun 24, 2011 07:42

Hi Ross, Great questions.

It’s just a bit early to see any sign of the *penicillium nalgiovense* yet. When you surpass the 75 hour mark and we go into the *drying phase*, you may wish to spray them again as we reduce the temperature also. Mold must have at least 75% humidity in order to survive. In meat cultures, *penicillium chrysogenum* is also used, but when it comes to cheese, cultures of *penicillium roqueforti* and *penicillium camemberti* are two of the more popular choices. They too, are available from Chr. Hansen in Denmark (Bactoferm™). It is distributed in Germany.

Just as a curiosity, sausages are usually “dipped” just after stuffing, but generally “sprayed” a few days later, just as the drying period begins. It isn’t critical by any means – just convenient. And you are most correct in saying they are more difficult to eliminate than to introduce. That’s why I like the idea of using plastic sheeting in your cabinets, although you’ll still see the flaky white stuff continuing to grow long after you remove the sausages. I’ve had good success with wiping out the chamber with a sponge dipped in a PineSol or bleach and water solution. Be sure to rinse very well. If you wish to be a little more drastic, place it in direct sunshine at low humidity.

Best Wishes,
Chuckwagon

*Chuckwagon*  
Posted: Fri Jun 24, 2011 11:44

**Controlling Your Fermentation Chamber**

The home sausage maker must have the upper hand in the management of *temperature* and *humidity*. Understanding these two elements is the first step of successful dry-curing. Actually controlling them is not as easy as one may imagine since in nature, it is most difficult to find the constant conditions required for the time required – typically weeks to months.
If the process of actually controlling both factors becomes too labor intensive, the enjoyment can be removed from the hobby of sausage making. Fortunately there is equipment available to assist us during the process so we don’t have to continually dampen and hang towels, fan the air out of the chamber twice a day, or continually fiddle with a heat or cooling source – all of which become mundane pretty quickly!

It is important to realize just how greatly specifications may differ, especially if a bio-culture is added. For instance, some “super fast” cultures of Bactoferm™ may require more than 105°F in temperature. On the other hand, the slow cultures may only specify 68°F in 90% humidity, dropping ten more degrees just three days later, while the humidity is decreased to about 70%. For this level of inconsistency, we need to be able to adjust controls precisely and easily.

A freezer, rather than a refrigerator, may be the best choice for a curing cabinet, as a refrigerator has a bulky freezing compartment to remove… with a separate set of controls. A refrigerator is designed to operate below the temperature of 40°F. A freezer typically operates at about 0°F. How do we bypass the controls (set by the manufacturer), that hold the temperature down? The answer is by purchasing a device called a “line voltage thermostat”, about sixty bucks online – double that price from sausage suppliers. I can adjust the model I ordered, to operate between thirty degrees below zero to a hundred degrees above, and it includes a temperature probe. Complicated wiring? Naw. All you have to do is plug the freezer power cord into the LVT and adjust the thing to the desired operating temperature – a simple twist of the dial. When you’re not using the freezer for dry-curing, you may wish to use it as a refrigerator to keep your suds cold. Simply adjust the dial.

Typically, a refrigerator maintains a humidity level of only about 30% to 40%. This dry environment would case-harden a salami in no time at all. Depending on the area you live in, the frugal remedy may consist of merely a lipped cooking sheet-pan holding just enough water to cover a pound of salt spread evenly across the surface of the pan. Although it may be a little inconsistent, it will provide about 70% relative humidity. The trouble with this method is that we often need 90% for fermentation. So, we introduce frozen jugs of ice – replacing them frequently - another labor intensive pain in the Ask me what I use. 😊It’s called an “in line humidistat” that controls a child’s room humidifier. The humidifier takes up little room and it’s plugged into the humidistat, (sensing the relative humidity). The control is set for the desired level of humidity, and presto – I forget it. The only hitch in the get up is that there are two types of humidifiers available. One provides warm-moist air, the other, cool-moist air. That’s the one you want in your fermentation chamber – the smallest, cool-moist air model you can find at your local hardware store. Be sure to use distilled water in the thing.

Dave asked me about his “frost-free” model refrigerator. Some models are timed to kick on for half an hour every twice a day. Other models periodically turn on at different times set by the manufacturer. In any case, the defrosting mechanism struggles to eliminate the moisture that we are trying to retain. It must be disconnected. Trace the wire and disconnect it. Often it is encased inside a tube that runs beneath the cooling coils. If you are using an in-line humidistat to control a humidifier, you’ll find that it kicks in as the defroster attempts to remove moisture. If you cannot locate the wire to disconnect the thing… Don’t worry about it! 😏uhh… that is… unless you are using only a tray of salt to add humidity to your chamber. In that case, you’ll have to go
after that little wire with a particular vengeance and a glint of impairing mischief in your eye. The size of the cutters you use to disable the thing depends upon how much trouble it was to locate in the first place!

Please note that Seminole has provided several pages of instruction involving the installation and use of these controls beginning on page 364 of his book, “Home Production Of Quality Meats And Sausages”. Diagrams are included so even a layperson like me can plug the danged thing in.

For reference:
Green Air™ makes a decent in-line humidistat. See it at www.greenair.com. McMaster-Carr™ has a good LVT at www.mcmaster.com

Best Wishes,
Chuckwagon

Chuckwagon Posted: Fri Jun 24, 2011 11:53

Don't forget to keep accurate notes fellars! Record the temp and humidity frequently for comparison. Check the equilibrium frequently by looking at the casings.

Has anyone seen my ol' pal JBK? Everything OK John? How is your project coming along. Anybody want to bag this stuff and go fishin' for a week?

Best Wishes,
Chuckwagon

Dave Zac Posted: Fri Jun 24, 2011 13:14

So I'm at 58.9 degrees this morning, 75% RH...gotta get the humidity up a bit but things are looking much better. Trying more (smaller) iced bottles covered with a towel as Ross suggested. I covered the chamber with a heavy quilt and I think that helped a bunch too.

And, I am getting mold! Seems to have taken about 75 hours to start to develop. Feeling pretty good about things this morning 😊

ssorlilih Posted: Fri Jun 24, 2011 14:20

There are trade offs no matter what you use for a system. Water vapor will condense on and cold surface. My ice jugs get covered with frost and then with liquid condensate as they warm but the moisture is not lost. Condensate on refrigerator cooling coils is drained into a pan under the compressor where it is evaporated by the compressor heat. Thus CW has to run a humidifier to
make up the lost moisture. I will probably upgrade my system in the future but for now I have an effective very low cost system that needs 5 minutes of my time twice each day.

Ross- tightwad home cook

uwanna61
Posted: Fri Jun 24, 2011 14:24

Quote:
Hi Uwanna. Hey dude, until you surpass the 75 hour fermentation period, you may wish to raise your temperature by ten degrees

CW I took these photos last night, at that time it was 96 hours. I dropped the temp down 4 degrees at hour 72, then it sat for about 6 hours. Then I dropped down to 57 degrees at 880 hrs. The casing are dry to the touch. I believe the photo has a glare that makes the salamis look wet..

Dave Zac
Posted: Fri Jun 24, 2011 15:23

ssorllih wrote:
There are trade offs no matter what you use for a system. Water vapor will condense on and cold surface. My ice jugs get covered with frost and then with liquid condensate as they warm but the moisture is not lost. Condensate on refrigerator cooling coils is drained into a pan under the compressor where it is evaporated by the compressor heat. Thus CW has to run a humidifier to make up the lost moisture. I will probably upgrade my system in the future but for now I have an effective very low cost system that needs 5 minutes of my time twice each day.
Concur...

ssorllih
Posted: Fri Jun 24, 2011 22:29

When I got home from work today I checked on the pigs and they are just starting to show some mold. Rather uniform except the ones that I have handled. Those are a bit blotchy. I wonder if the mold will spread or if I should spray them again just for good measure? Temperature and RH holding steady.

Ross- tightwad home cook

Chuckwagon
Posted: Sat Jun 25, 2011 00:39

Grreat Guys!
OK, after hour 72, lets begin to ease the temperature down a bit along with the humidity. Over the next 24 hours lets drop the temp to about 57 degrees F. After that, we'll need to drop the temperature by only ONE degree every two weeks... until we arrive at 54 degrees F.
During this same time period, we'll need to reduce the humidity incrementally also. Slowly lower it to 80%. During the last week, we should be at about 75%.

I'm glad to see all of you doing so well! 😊

Best Wishes,
Chuckwagon

ssorllih
Posted: Sat Jun 25, 2011 01:40

Remember that water vapor is lighter than air and warm air is lighter than cold air. Therefore a vent in the top of the chamber will allow the humidity to escape and will confine the cold air. A vent in the bottom of the chamber would spill cold air and the temperature would rise.

Ross- tightwad home cook

uwanna61
Posted: Sat Jun 25, 2011 02:56

Quote:
Remember that water vapor is lighter than air and warm air is lighter than cold air. Therefore a vent in the top of the chamber will allow the humidity to escape and will confine the cold air. A vent in the bottom of the chamber would spill cold air and the temperature would rise.

Well if try to vent my chamber (fridge), I will have to go through the freezer, and then everything will go south! I will have to rely on the fan and open the fridge door once a day for ventilation.

Chuckwagon
Posted: Sat Jun 25, 2011 18:20

How about checking in folks? The fermentation period should be winding down as we drop the temperature to 60° and slowly bring it down to about 54° in about two and a half months. We’ll also lighten up the humidity to about 80% and even more after drying, to about 75% for storage. How was your fermentation success? How many hours? What is the RH currently? What is the current temp? Have you achieved “equilibrium”?

I know some of you folks have had to work forty plus hours a week and have a life with responsibilities outside the fermentation chamber. Some of you are just a bit behind in getting started. Don’t fret. Just continue with the project as your time permits. We’ll all still be here. Just let us know what is happening. For those of you who are grindin’ and stuffin’ this weekend, don’t forget to weigh and record the weight in your notebook. When we achieve a loss of about 30%, we’ll slice one open to test it. Of course, it may take several slices and a couple of cold suds to make a good determination. Shucks pards, sometimes it takes all day long to make such a dutiful determination of lucid exactitude with infallible, precise, and conclusive judgement! 😎
Just one of the hazards of this hobby. 😅 It can really make a person thirsty eh? Better stock up on plenty of refreshment! 😊

Best Wishes,
Chuckwagon

ssorlith 🍾
Posted: Sat Jun 25, 2011 18:41

Cut a hole in the top of my chamber last night. I made the hole tapered and saved the plug. I just made a check after changing the ice bottles and removing the wet towels. I seem to be at 60 degrees and still about 80% RH. I may take the salt marsh out.
Ross- tightwad home cook

partycook

Posted: Sun Jun 26, 2011 02:18
Hi fellow sausage makers,
I managed to get the salami stuffed and into the fermenter on Monday. No problem holding 68 degrees and 90% humidity. Applied mold culture on Thursday and began to drop the temperature and humidity, it is now at 60 degrees and 80% humidity. Fan speed is still on slow. Still no sign of mold formation.

John

Chuckwagon posted: Sun Jun 26, 2011 02:42

Sound great Partycook. The mold will start showing up in another day if you applied it on Thursday. Did you remember to mix it with distilled water? For the next six weeks, don't allow the RH to drop any further. During the last week, it won't hurt to let it come down to about 75%. You may wish to spray the mold again if you don't start getting a nice fluffy, white mold after this weekend. Just be sure to keep away any colored or "fuzzy" mold. Sounds like your project is doing just fine. Congrats John.

Best Wishes,
Chuckwagon

Dave Zac posted: Sun Jun 26, 2011 17:04

57 degree and humidity at 83%. The smell when I open the chamber is becoming incredible to me.

The Spanish Chorizo seems to be firming up quite well. As I realize it has only been 1 week, I can hardly wait 1 month for the chorizo and 2 months or more for the salami 😊
Maz
User
Posted: Sun Jun 26, 2011 18:03

I read that some of you were having problems with controlling air flows, after talking to my son about cooling systems on PC's he told me about a product similar to the one on this site.  
http://www.dealextreme.co...er-for-pc-13987
Not sure if it is of use to any one just a thought. 😏

ssorlih
Posted: Sun Jun 26, 2011 21:59

Serious question. What is the drying rate curve for various sausage diameters? My 2 inch diameter sausages have a circumference to cross sectional ratio of 2:1, a 3 inch sausage has a ratio of 3:2 and a 4 inch sausage has a ratio of 1:1. Obviously the smaller sausage will dry more quickly than the larger. My question stems from the weight loss on one of my subjects. 10% in 5 days.

Ross- tightwad home cook
I dipped the salami Alessanddra (project A) in the mold 600 on 6/22. The salamis have minimal coverage, nothing like the pepperoni (project P) which I sprayed, and are covered from top to bottom with white mold. I moved project P from the smoker to the curing fridge last night, after the 72 fermentation process.

Long story short: I dipped project A after the 72 hr fermentation step and sprayed project P before the fermentation step. Should this matter, I’m thinking temperature and humidity plays a role in this?

I guess my burning question here is do I spray another application of mold 600 to the project A? Is it critical to have the white mold on the salami? I have seen a few recipes I have read, suggest if mold is objectionable wipe it off with a clean cloth and vinegar.

Below is an example.

Thanks.
Uwanna, smoke inhibits mold growth.
I sprayed my sausages as soon as they were stuffed with a spore mix only minutes old. The spores didn't seem to care and have grown as they should.

Edit to add. Are there any signs of mold growth? pinhead size white dots? if there is any sign of life then you are good to go but like planting any crop it won't hurt to plant again.

I read an interesting paper yesterday from Clemson University College of Applied Microbiology. That is precisely what we are doing here. This is applied microbiology at its best.

Ross- tightwad home cook

uwanna61  
Posted: Tue Jun 28, 2011 04:38

Quote:
Uwanna, smoke inhibits mold growth.

SSorllih
Yes there is some white mold growth on the Salami di Alessanddra. The pepperoni which I fermented in the smoker with no smoke, are fully covered with white mold. No biggie just wondering if I should reapply the mold 600 to the salami Alessanddra. I’m sure it will be fine. Thanks.

ssorllih  
Posted: Wed Jun 29, 2011 05:43 Everything you learned in school & never thought of since

In this project we are applying all of the science we studied in high school and wondered why. We are using molds and bacteria to our benefit. Remembering wet bulb, dry bulb, dew point, relative humidity, grams, kilograms to ounces and pounds conversions. Celcius to Farenheit temperature conversions. We are using math that we thought was a complete waste of time. We can find a recipe for one Kg of meat but we have three pounds, now what do we do? apply our education and have fun. The list of ways that we can use our heads is long and wonderful. ENJOY!

Ross- tightwad home cook

uwanna61  

ssorllih

Quote:
In this project we are applying all of the science we studied in high school and wondered why.

Science class 😜I think I was sleeping in that one. I remember gym class, but science was a blur 😜
On a serious note, the alessanddra “project A” the salamis are finally covering with white mold. It looks the pepperonis from “project P” are sharing the mold with project A. The pepperonis are so white; they look camouflaged with the walls of the fridge 😂

Chuckwagon

😂😂😂😂
I'm chuckling because you won't believe your eyes about a month from now! 😃The mold is actually performing a couple of jobs for our benefit.

Many thanks to Ross for helping out while I had to go blind for a day. 😃That ol' doctor has no sense of humor whatsoever. The first time he ever put a needle in my eye, I guess I jumped about a foot in the air then did the “electric bugaloo” on the ceiling, while screaming like a banshee! He just looked at me and said, "Do you think you could kindly refrain from thrashing about". Thrashing about indeed! Thrashing about my butt! I thought about giving the dude a size 12 cowboy boot 'leather enema' for the afternoon... just to see if he "thrashed about". 😁

Ross, thanks again for your help in answering some very good questions that were posted.
Oh, and yes... Ross wrote:

Quote:
I think a cooked sausage would be a good guided project for filling the space during the finishing times for the dry sausages.

I couldn't agree more. Let's do it. Got any preferences?

Best Wishes,
Chuckwagon

uwanna61
Posted: Thu Jun 30, 2011 00:28

Chuckwagon wrote:
I thought about giving the dude a size 12 cowboy boot 'leather enema'

Ouch, that would hurt. I don’t know, hmmm let me see, a boot in the shorts or a needle in the eye!

I would definitely take the boot 😂

Chuckwagon wrote:
I think a cooked sausage would be a good guided project for filling the space during the finishing times for the dry sausages.

Welcome back CW
Yeah sounds good, I just put in my order for 20 lbs of pork from our local butcher yesterday. Are we talking a smoked salami? I would be interested in making salami; I have a bag of high temp “lava jack cheese” I purchased from Butcher Packer just begging to go into 10 lbs of smoked salami.

Ross way to go big guy 😊

Chuckwagon

Posted: Thu Jun 30, 2011 01:04

Topic split 7.1.11 20:50 by Chuckwagon. See: Topic - “Cured n' Cooked Sausages” in the “Sausages” Forum.

Topic split 7.1.11 21:08 by Chuckwagon. See: Topic - ”Cost Of Sausagemaking Equipment” in the "Hardware" Forum

partycook

Posted: Thu Jun 30, 2011 05:27

fellow sausage makers,
So far everything seems to be going well . I have re-sprayed with 600 mold culture and while the mold cover seems to be thin it is even. I am using a green air humidity controller. I have also purchased a hygrometer from the sausage maker . Problem being green air unit reads 80% and the sausage maker unit reads 55% . I believe I may have to reach a bit deeper into the wallet and buy a unit that can be calibrated. Is there any other way to tell if I am at the correct humidity level ? If I open the door on my aging chamber(fridge) for more than 30 seconds the ultrasonic humidifier will turn on.
What is the best way to temporarily hold extra mold culture?( temperature after it is mixed).Is it beneficial to vacuum seal any left over cultures before refreezing?
John

ssorlih

Posted: Fri Jul 01, 2011 04:42  The science of chamber control

In order that our sausages do not dry too quickly we must have sources of water vapor (moisture)that are larger and more available than the sausage casings. A silk handkerchief Will dry very quickly but it won't hold much water. A bath towel hold a lot of water and because of its texture has a very large surface area. A smooth sausage 3 inches in diameter and 18 inches long has a surface area of 169 square inches. That is equivliant to a 13x13 piece of paper. A couple of face towels will be about 12x15 inches with two sides each and thus will expose 720 square inches of evaporative surface. This is four times the area of the sausage presuming that they are perfectly smooth like the sausage but the towels have thousands of thread loops that increase the surface area.
All of this means that that water vapor needed to maintain the humidity will be between 4 and 10 time more likely to come from the wet towels than from the sausages.
We expect and want our sausages to lose weight as they dry but we want that to happen slowly.
Chuckwagon posted:

Partycook wrote:

Quote:
Is there any other way to tell if I am at the correct humidity level?

There is indeed. Although it is archaic, it is surprisingly accurate. It is the test of the “dew point” using what is called a “sling psychrometer”, made from two thermometers fastened to a board on which the end of the mercury tubes (bulbs) are extended. One bulb is kept dry - the other, kept moistened by a little wet bag. A fan blows air on the thermometers as readings are taken. The theory is that water will evaporate from the little bag, cooling the wet bulb. The difference between the two readings is located on a pre-calculated, printed “Relative Humidity And Dew Point Table”. My recommendations? Purchase a good, quality, hygrometer from a reliable supplier. 😊

Quote:
What is the best way to temporarily hold extra mold culture? (temperature after it is mixed).

If it is just a matter of hours, lowering the temperature (refrigeration) will keep the numbers down significantly, although it's not recommended for any great length of time. Toss it and make a new batch for reliability.

Quote:
Is it beneficial to vacuum seal any left over cultures before refreezing?

If you have a vacuum sealer, it surely couldn’t hurt!

Best Wishes,
Chuckwagon

ssorlih posted:

I am 11 days into this production with 2.4 inch sausages. One test sausage is down to 12 ounces from 15 at the start. Another 10 to 12 days and it may be time to take a slice.

Ross- tightwad home cook

ssorlih posted:

This morning my chamber conditions were 59 degrees F and 85% RH. I am using 3 litre jugs of ice three jugs at a time and this is the lower limit with this combination. Later I will try five 2 litre bottles at a time. More surface area and a little more ice. I may need to seal the door better although the fit is quite good.
Ross- tightwad home cook

uwanna61
Posted: Sun Jul 03, 2011 15:51

Hey Ross
I was also thinking of taking a weight check later today. Project A is at day 14 and project P is at day 10. Still need to get on the stick and make project S, but the weather is warm here, humidity good but temps are high.

Chow..

partycook
Posted: Sun Jul 03, 2011 19:00

Chuckwagon
Once again thank you for help in answering my questions. My hygrometer was 20% off. I called them and they sent out a replacement a.s.a.p. I ordered some more parts for my second fermenter and since this unit was originally was only intended for higher temperature fermentation (no cooling) I will have to test it to see what adjustments I will have to make to maintain proper airflow and temperature. I would like to make project "P" & "S" and add them to the drying chamber as there is room available.

John

Chuckwagon
Posted: Tue Jul 05, 2011 10:36

Nice goin' guys! 😊
Now, just hang in there and check on your babies once a day to make sure they're not turning green and running down the street! 😅

Look how far we've come already! A couple of weeks into the project and everyone's lookin' like top hands! Yeeeee Hawww!

Best Wishes,
Chuckwagon

uwanna61

Hey all
Just wanted to check in. Well I have taken a weight check on the salamis (project A) today, and after day 28 it looks as if my salamis are drying faster than expected! I think this must be related
to the new fan I installed before starting the project 😄 As of today, the salamis average weight loss is at 30%, too fast, so back to the drawing board!
I had made Genoa salami in the past and it took about two and half months to dry, and did not dry so quickly like the project A. Maybe I will try again without the fan 😕

Not all is at a loss. The project P seems to be ok, with a two week dry time 😊

ssorllih 🎉

Try a rheostat on the fan circuit and just slow it down a bit. I have a very unscientific method of double checking my drying rate. I hang a wet paper towel up with the sausages and if it dries in one day it is too fast and I add humidity. Lately it is taking about a day and a half.

Ross- tightwad home cook

Chuckwagon 🐎
Posted: Thu Jul 07, 2011 02:57

Uwanna, please refer to the SIXTH post on the following topic:

http://wedlinydomowe.pl/e...r=asc&start=120

I am very concerned about this premature drying. I'd like to discuss this further with you. Don't toss anything yet. My goodness, there are things we can do this early in the project. First, lets track down the source of the excessive drying. Have you computed your "air exchange" also called "air speed".

See the following link for a variable-speed controlling rheostat:
http://www.dealextreme.co...er-for-pc-13987

Best Wishes,
Chuck O

ssorllih 🎉
Posted: Thu Jul 07, 2011 14:51

Just a technical note here. When your wet bulb thermometer reads the same as the dry bulb it may mean you need to add some water to the wet bulb reservoir. Don't ask how I know this. 😁

Ross- tightwad home cook

uwanna61 🎉
Posted: Thu Jul 07, 2011 16:12
Hey all
Sorry for the delay, we had a major lighting storm here yesterday and no internet service until this morning.

CW

Quote:
Uwanna, please refer to the SIXTH post on the following topic:

I did go back and read the sixth post, are you implying that the fermentation time was not long enough?

Like I mentioned in the above post, I'm sure the fast drying process is related to the new fan I installed at the start of this project. I have to admit, I got caught up in the air flow, temperature, and humidity levels. I have made dry cured salamis in the past, and never had a quick drying issue like this. I think I will try another batch without the fan and just open the door once or twice a day for circulation. I have included a couple of photos below.
ssorllih

Posted: Thu Jul 07, 2011 21:37
Too my completely untrained eye those appear to be smaller than the casings suggested in the original recipe. That would account for some of the short time drying. But the cut end appears to be completely uniform in color. If probing with a butter knife revealed uniform firmness and if it smelled good I would do the old taste test. If the mouth feel and taste passed, I would cheerfully eat it.

uwanna61  
Posted: Thu Jul 07, 2011 22:37

Ross

😄 already tried it, feels fine and tastes ok, the outside appearance just looks wrinkly and dry. To be on the safe side, maybe eat a slice with a shot of whisky 😏

I'm sure the fast drying comes from the fan. I do have a rheostat to control the fan, but again, in the past I have made fermented salami and never had an issue with drying to quick, if anything took forever. I shut it off for now.

Chuckwagon  
Posted: Fri Jul 08, 2011 08:38

Hi Uwanna,
You wrote:

Quote:
are you implying that the fermentation time was not long enough?

Naw pard, I'm not implying anything. I'd just like to know the air speed you've used. I believe you are correct in assuming there has been too much air drying. A rheostat would solve the problem. Would it be possible for you to give us a really, really, close-up view of the texture (sliced)?
Also, this far into the project, you should have a bit more white mold. The salami should be entirely covered by now.
Hey Uwanna, I'm not being critical... I'm trying to help figure out why it has dried prematurely. If it is indeed at 30% loss of original weight, you could safely taste it at this point. Do you plan to run a pH test on the salami?

Please stay in touch. Let us know what is happening.

Best Wishes,
Chuckwagon

ssorlih  
Posted: Fri Jul 08, 2011 13:56

After this project is done I am going to stuff several casing sizes from 40 mm up to 120mm and track drying rates. Weight versus time. I will wait until I can get some very inexpensive meat but I think that this is data we need.
I wonder if I could do it with wet sawdust?

Ross- tightwad home cook

uwanna61

Posted: Fri Jul 08, 2011 15:35

CW Quote: Uwanna, please refer to the SIXTH post on the following topic:

I guess I was wondering if maybe you noticed anything out of the ordinary from the pictures I posted on the sixth post.

As for the white mold, after the 72 hr fermentation step, I dipped the project A into a mold 600 solution, which I mixed per instructions, the mold was slow growing.

Quote: A rheostat would solve the problem.
For the rheostat, I have a solid state controller on the fan, which slows the fan down to a crawl. I will admit I did have the speed up a little, but not enough to launch a sail boat 😁

Quote: Hey Uwanna, I'm not being critical
I know you’re not being critical. Not to worry, I’m not put off by this 😏
And I did test the PH level, it is at 5.3
Here are a few pictures.
My links are about that size and as of last night 16 days into the chamber they are down 24%.
This is one of the reasons that I want to graph drying rate versus diameter for several sizes. I think that a cotton cloth tube sewn and the seam turned inside. Sawdust mixed with water and stuffed tightly into the casings, weighed and hung to dry and weighed each day until they no longer lose weight. As long as they all hang in the same area with the same air flow and conditions then drying times should be strictly a function of diameter. If anyone sees a flaw in this idea please share your thoughts with me on the open forum.

Ross- tightwad home cook

Chuckwagon

Posted: Sat Jul 09, 2011 00:26

Uwanna ol’ pard,

Your photo clears up a question or two. If you look carefully around the inner edge (just beneath the casing), you’ll see a “ring” of slightly darker colored meat. This is case hardening and is caused by accelerated evaporation (out of equilibrium with the diffusion).

How about reviewing the bottom post (15th post) on page 8 of this topic (Project A)
Here’s a link:
http://wedlinydomowe.pl/e...r=asc&start=105

In this case, it is just beginning. Eventually it would become a gray-colored ring with hardened meat just beneath it and having a “mushy” meat near the center. So, yes I would agree with you that there has been too much air circulation. If you leave the “drying” stage and go to the “storage” specifications, I believe it should continue to dry just a bit and be a good, edible, product in just a bit more time. Can you bring it down to 55° F. and lower the humidity to about 75%?

Don’t toss it Uwanna, it’s not “gone”. It’s just slightly case-hardened.

Best Wishes,
Chuckwagon

partycook

Posted: Sat Jul 09, 2011 05:57

Fellow sausage makers,
Well I have just finished making projects "S" & "P" and have placed them in my fermenter unit. Needless to say my tests and the actual results differ. I am using a converted freezer which I originally had intended to use for high temperature fermentation as it does not have cooling capabilities. I am using a computer fan with a variable voltage supply for controlling my air flow. I am also using a cold air humidifier for regulating my humidity. I will be using ice packs and frozen water bottles to control my temperature. After adding so much product to the unit the temperature went way down. I imagine it will take a few hours before things stabilize.
John

Chuckwagon

Posted: Sat Jul 09, 2011 06:11

Good job Partycook! Your efforts will pay off big time. I'm glad you read about the difference using a “cold” air humidifier. Have some patience and you will have some gold on your hands in another month or two!

Best Wishes,
Chuckwagon

ssorliih

Posted: Sat Jul 09, 2011 16:13

I was pinching the top end of the links today and the skinny part near the string is hard dry but the rest is uniformly firm. I think that they are drying rather quickly but my RH is up and the temperature is in the upper fifties. It has only been 18 days.

Ross- tightwad home cook

ssorliih

Posted: Sat Jul 09, 2011 16:40

For all intent and purposes I have the same problem as Uwanna 61. But it isn't from excess air flow my fan is very small and doesn't blow on the links. I am just gonna mist with distilled water twice each day.

The taste is proper for salami but it still has a raw meat mouth feel so I guess that is called mushy. It is distinctly softer in the middle than at the edges.

Ross- tightwad home cook

partycook

Posted: Sat Jul 09, 2011 19:40

Hi Chuckagon
Is it better to apply the mold 600 at the beginning of fermentation or after the 72 hour fermentation period? I have seen it stated both ways.

When we wake up starter cultures is there a proper amount of water to use as most of the recipes seem to be for 10 lbs.?

John

Chuckwagon

Posted: Sun Jul 10, 2011 05:05

Uwanna wrote: Quote: To be on the safe side, maybe eat a slice with a shot of whisky.

Hmmm…. Just right off hand, I’d say several of us ought to join Uwanna and test “a lot” of his sausage slices, each slice with proper lubricant eh? This testing may take several days! By the way Uwanna, the fat definition in your sausage is remarkable. Very well done.

Partycook wrote: Quote: Is it better to apply the mold 600 at the beginning of fermentation or after the 72 hour fermentation period? I have seen it stated both ways.

I put it on the minute is it hung up. I’ve seen others wait until the fermentation has finished, but there are reasons to have mold developing during fermentation. The sooner the better, in my opinion. Stan Marianski has written that it just isn’t that critical, as long as it is applied at some point.

Partycook also wrote: Quote: When we wake up starter cultures is there a proper amount of water to use as most of the recipes seem to be for 10 lbs.?

When mixing Bactoferm Mold-600, add 3 grams of the M-600 to a cup of 68°F. warm, distilled (chlorine free) water. Allow the mixture to stand 12 hours. Following the 12 hour waiting period (called the “lag phase”), add the mixture to 1 liter of distilled (chlorine free) water. Spray using a misting sprayer or dip the sausages in and out of the solution.

Whenever mixing other starter cultures, follow the instructions on each packet. Use only the amount prescribed in each recipe, then freeze the remaining culture. Usually, the recipe will specify a small amount of water to be added during grinding. Mix the culture with the water for good distribution.

Starter cultures containing other types of bacteria provide additional benefits as well. Color fixing and flavor forming cultures are presented containing the “slow-pokes” staphylococcus and micrococcus (aka-kocuria). Both tolerate increased salt levels very well, although they grow slowly. As we add lactobacillus or pediococcus to increase acidity, we must use caution, as pH below 5.5 may be achieved in merely half a day - allowing the “slow pokes” (staphylococcus and kocuria), no time to develop.

Why do we even use Mold-600? These surface-covering cultures are other types of starter cultures containing penicillium nalgiovese, added to inhibit the development of unwelcome
molds, yeasts, and bacteria. Bio-protective cultures are those containing the added benefit of antimicrobial bacteriocins, decimating undesirable bacteria.

Here are a few observations to realize while you’re trying to make sense of all this new information. It hasn’t been all that long ago that man had no idea whatsoever, just what was responsible for making the changes in your Allysandra even happen.

--Sugar is not normally added to this type of sausage because the more sugar that is metabolized by added lactobacillus or pediococcus, the higher the acidity in the meat, often giving sausage too much “tang” or sour taste. High-quality European salamis - such as your Allysandra - have a mild taste, as they contain no added sugar.
--The speed of fermentation is directly attributed to the temperature inside the fermentation chamber. Up to a point, the higher the temperature, the faster the fermentation.
--The degree of acidity in a sausage depends upon the amount (and type) of sugar it contains.
--Fermentation ceases when there is no longer “free water” or more sugar available to the lactobacilli or pediococci in a sausage, or the temperature falls below 50°F. (10°C.). All bacteria require some amount of “free water”.
--The curing chamber must contain some type of small fan producing slow-moving air to inhibit the growth of slime on the surface of sausages. However, too much air speed will dry the surface too quickly, not allowing the proper amount of moisture to leave the interior of each sausage.
 ödül Lactobacillus and pediococcus (lactic acid bacteria) are used independently of one another as each function best at contrasting temperatures for maximum growth.

I have very much enjoyed helping you fellars understand more about the sausage-making process and feel like we have already accomplished quite a bit together. I can hardly wait until you cut off that first thin slice of flavored gold. What I would give to see your faces light up! Until then, stay healthy and cool this summer.

Best Wishes,
Chuckwagon

**ssorlilh**
 Posted: Wed Jul 13, 2011 14:49

My sausages are developing scabs on the pin holes made to deflate air pockets in the sausage. They are waxy and without taste. they displace the white mold and are on average about a half inch wide and slightly longer.

Ross- tightwad home cook

**uwanna61**

Ross Quote: My sausages are developing scabs on the pin holes made to deflate air pockets in the sausage
Yeah, for some reason I could not bring myself to prick holes in my fermented sausage. I was concerned that something would grow or the mold would surround the meat inside the casing or something like that. Not sure if I should have, but at the last minute opted not to put pin holes in the salami.

**Chuckwagon**

Posted: Thu Jul 14, 2011 02:24

Ross, you wrote: **Quote:** My sausages are developing scabs on the pin holes made to deflate air pockets in the sausage.

We need a photo Ross. I suspect that what you have is the normal growth of a very much later-occurring organism with the highly-technical, scientific, name of... “yeast”. 😊Shucks ol’ pard, they are just part of the process and as they are anaerobic, they may live just below the surface as well as upon the surface, assisting in fermentation by lowering acidity, thus improving flavor in “dry-cured” salami. They are less sensitive to salt than other microorganisms and must have high humidity to survive. It’s interesting to note that *debaromyces hansenii* and *candida formata* are highly salt tolerant and both consume lactic and acetic acids and decompose peroxides, thus augmenting and complementing flavors.

It is interesting to note that *debaromyces hansenii* also produces the very distinct odor of DaveZac’s *ammonia*. This particular yeast is often added intentionally, not only for the positive characteristics stated, but because it is also proteolytic (breaks down proteins) and lipolytic (breaks down fats), enhancing flavor even further. How about a photo pal?

OK, fermentation dudes!... can you name another microorganism that produces ammonia as well? After the crap I went through a couple of years ago on (ahem, ahem...) *another* site... I feel qualified to ask. First with the answer gets a free season pass for swimming in the Great Salt Lake! 😊

Best Wishes,
Chuckwagon

**ssorlih**

Posted: Thu Jul 14, 2011 02:46

How's that?

Ross- tightwad home cook
Dave Zac  
Posted: Thu Jul 14, 2011 02:47
Chuckwagon wrote: OK, fermentation dudes!... can you name another microorganism that produces ammonia as well? After the crap I went through a couple of years ago on (ahem, ahem...) another site... I feel qualified to ask. First with the answer gets a free season pass for swimming in the Great Salt Lake! 😛

Best Wishes,
Chuckwagon

Mold eh?
Dave

ssorlih  
Posted: Thu Jul 14, 2011 02:47

I don’t know the name but I have emptied enough diaper pail to know that there is an organism that converts urea to ammonia.

Ross- tightwad home cook

uwanna61  
Posted: Thu Jul 14, 2011 02:52

nitrite 😞😞😞

Chuckwagon  
Posted: Thu Jul 14, 2011 04:59

Hi Guys,
Yup, Dave got it.... it’s a mold alright, but what is the name of the mold? Remember? It’s part of your Allysandra Salami now. 😁

ssorlih  
Posted: Thu Jul 14, 2011 05:30

I presume that we applied it deliberately. That would make it penicillium navgiovense. I had to look up the spelling.
What about my scabby sausages?

Ross- tightwad home cook

Chuckwagon  
Posted: Thu Jul 14, 2011 06:20
Oh sure Ross.... Uh...hmmmm.... you'd better look it up again! (spelling) har, har... Shucks ol' pard, remember, I "aced" chemistry! brag, brag, brag! Want to know how I did it? I intimidated the teacher quite a bit! It had a lot to do with my spicy-hot "jerky breath" and ridin' my horse inside the classroom after feedin' him whiskey and chocolate! Oh yes, about your sausages... inspect the color... I can't quite tell by the small photo, but I didn't really like the color. Take a clean dish rag, put a bit of vinegar on it, wring it so it's just moist, rub in some salt and scrape the "scabs". Don't go clear through the casing - just clean the stuff up a bit. Wipe it with a clean, damp cloth, then spray on a little more M-600 and allow it to crowd out the other microorganisms.

Don't fret about the stuff. If you can't get it all, it's ok. It cannot go deeply into the meat as it needs a little oxygen. Even if it did, it would only lower the acidity and improve the flavor. Unlike bacteria, there are no known species that grow only anerobically (obligate anaerobes). It's interesting that only about 1% of all yeast species have been described. They are microscopic fungi that grow as single cells. There is one in particular that we want to avoid - now, let's see if I can spell the danged thing... Zygosaccharomyces (genus) and it has long been associated with the food industry - as a spoilage yeast! Yuk. You wouldn't believe where this stuff can grow - ethanol, acetic acid, sorbic acid, benzoic acid, any high sucrose, and even sulfur dioxide!

Well ol' pal, we're in the home stretch now. Did you see that gorgeous pepperoni that Uwanna made. Are you salivating yet? Keep the faith bro, along with the proper temperature and humidity!

Best Wishes,
Chuckwagon

ssorlilh
Veteran
 Posted: Thu Jul 14, 2011 14:22

I shall make that happen when I get home from work today. Thanks. Spelling can be blamed on my old tired eyes Try nalgiovense. Thanks.

Just click that thumbnail and It takes you to the album. saves band width on the forum.

Ross- tightwad home cook

partycook
 Posted: Thu Jul 14, 2011 21:12

Well after 22 days I have just weighed my Salami di Alessanddra the weight loss is over 30%. 1692g -1178g 1714g -1162g 1686g - 1154g . My curing unit is at 57 deg., humidity 80% and fan speed is adjusted to slow. I have just taken project "S" and "P" from the fermenter and added them to the curing unit they have been sprayed with mold-600. I am going to attempt to post a pic. from photobucket. Didn't get it to copy so back to the drawing board.
Hi Partycook,
Nice goin’! Did you happen to notice how uniform the weight reduction in each sausage has been. As you go into the storage stage, you might wish to drop the humidity down just a little. Somewhere right around 75% is ideal. How does your mold look? Do you have any evidence of yeast growing like our buddy Ross has? That ol' codger has so much yeast going that we may have to take up brewing beer pretty soon. 😊

Best Wishes,
Chuckwagon

I rather doubt that it is the right variety for brewing it certainly doesn't taste like a baking yeast and it smells better than candida sp.

Ross - tightwad home cook

An interesting event. The scabs on my sausage have been covered over with penicillium mold. So some I have cleaned away and some I have left covered with mold. I ate a piece of the salami tonight and the taste is right from what I remember from fifty years ago. I haven't liked the salami that we could buy for the last 30 or 40 years so I haven't bought any. It wasn't worth the price. This seems like it will be worth the trouble.

Ross - tightwad home cook

Ross, if you think it's good now, just wait until it loses a bit more weight, becomes more dense and darkened in color, and has even more pronounced flavor. I had some for lunch today from a previous batch and it was maaaavelous!

Just think... only 30 more days from today and you'll have bragging rights and photos to post all over the net! Wow, the time has passed quickly eh?

By now, you should have a solid mass of white all over the sausages. Often when they are "splotchy" (not my word), it is because people handle them too much as they are being hung. By
the way, what is your RH and temp? Are you still keeping your notebook? Don't forget to record these things in it for future reference.

I think you and I could take a lesson in notekeeping from Uwanna. He has just produced the best lookin' pepperoni I've seen in a long time, and it's because he kept experimenting with new small alterations to his recipe. He has "fine tuned" a pepperoni that any large pizza corporation would give their eye teeth to lay their hands upon. And it's because he kept tweaking the stuff by keeping good notes.

Ross, something tells me that you will have the same success with Project A as Uwanna had with "P". You've babied those "piggies" like a worried father. In another month, we'll toast your success from 2500 miles away!

Our fellow member Jason Story and his fiance' are going to open a charcuterie shop in D.C. I'm excited about it and have been following his project. The next salami project we take on, we'll have him be the "concertmeister" eh? These young folks are sharp as a tack!

OK, Ross, visit your dentist and have him sharpen your incisors and polish your canines! We're almost at the "test" stage! 🥂

Best Wishes,
Chuckwagon

ssorllih posted Fri Jul 15, 2011 14:51

The spoltchy comes from replacing the ice jugs every day and bumping the pigs. This morning I was 53 dry bulb and 51 wet bulb. That should be about 82 %RH Been holding it on the high sude because of early signs of quick drying. Sprayed new penicillium N. on last night and this AM.

Oh yes, Keeping notes of any changes that I make.

Jason Story I wish you great success. You are entering a seriously tough business.
The death of this man has created an open niche. http://www.baltimoresun.c...0,648526.story
I am not being morbid his story is worth reading.

Ross- tightwad home cook

ssorllih posted Fri Jul 15, 2011 23:25

i posted sometime ago that I have found it easier to introduce mold spores than to eliminate them. This morning I found that some of my bread had gone moldy. Not the usual blue stuff just nice fluffy white mold.
Click on thumbnail and link to full size pix and my album.

Ross- tightwad home cook

uwanna61
Posted: Sun Jul 17, 2011 03:12

Quote: I think you and I could take a lesson in notekeeping from Uwanna
Shucks pardoners, you guys paved the way I just followed along, but thanks for the compliment.

Chuckwagon
Posted: Sun Jul 17, 2011 06:31

Ross wrote: Quote: I found that some of my bread had gone moldy.
Holy brochotrix thermosphacta... Batman!

ssorlih
Posted: Sun Jul 17, 2011 15:04

Edible? Safely? Will it prevent the blue/black mold? Edit to add: Save your fingers ! Thanks to the internet I am getting a crash course in microbiology. So far i have determined that it is non pathogenic but a spoilage bacteria .

Ross- tightwad home cook

Dave Zac
Posted: Mon Jul 18, 2011 02:17

Update on my project. Weighed in today:

17%, 18%, 19% 19.5% weight loss on the salami. Interesting to note the left side of the chamber is 1-2% behind the the right side. I'll rotate and hopefully be even at the end.

Is this about where should expect to be 4 weeks in?

Update on my Spanish chorizo that went in at the same time: 33% weight loss. I cut one link to try. The casing (hog) was a bit 'wet' to the touch. not really slimy but more moist than dry. I worried a bit about it but after one hour or less on the kitchen counter and some 'testing', the casing is dried nicely.
Taste is a bit salty and nicely spicy. I think it needs another 10% or so of dry time.

Any comments from the experts?

Chuckwagon
Posted: Mon Jul 18, 2011 07:48

Dave wrote: Quote: Update on my project. Weighed in today:
17%, 18%, 19% 19.5% weight loss on the salami. Interesting to note the left side of the chamber is 1-2% behind the the right side. I'll rotate and hopefully be even at the end. Is this about where should expect to be 4 weeks in?

Spot on, Dave! You're doing something right pal! Another month and it will be time for the harvest! Rotating is a great idea.

Quote: Update on my Spanish chorizo that went in at the same time: 33% weight loss. I cut one link to try. The casing (hog) was a bit 'wet' to teh touch. not really slimy but more moist than dry. I worried a bit about it but after one hour or less on the kitchen counter and some 'testing', the casing is dried nicely. Taste is a bit salty and nicely spicy. I think it needs another 10% or so of dry time.

Dave, what recipe did you use for the chorizo? Can you post a side-view photo also? Will it snow on Christmas eve? Am I asking too many questions? Was the photo taken after the "end" had dried an hour? It looks a little... uh... "dry" 😅

Quote: Any comments from the experts?
Uhh.... I don't know any "experts" except for Stan, and he's in Poland for a visit.

Best Wishes,
Chuckwagon

Dave Zac  
Posted: Mon Jul 18, 2011 14:01

**Quote:** Dave, what recipe did you use for the chorizo? Can you post a side-view photo also? Will it snow on Christmas eve? Am I asking too many questions? Was the photo taken after the "end" had dried an hour? It looks a little... uh... "dry. I'll post the recipe and side view photo tonight.

It's actually not too dry at all. That photo is after a hour or so of exposure but I think a fresh cut will look similar.

Dave Zac  
Posted: Mon Jul 18, 2011 23:21

My recipe actually came from this site for chorizo: [http://www.wedlinydomowe.com/sausage-recipes/chorizo](http://www.wedlinydomowe.com/sausage-recipes/chorizo)

Meats Metric US
- lean pork, ham or butt (<20% fat) 1000 g 2.20 lb.

Ingredients per 1000g (1 kg) of meat
- salt 28 g 5 tsp.
- Cure #2 5.0 g 1 tsp.
- dextrose (glucose), 0.2% 2.0 g ½ tsp.
- sugar, 0.2% 2.0 g ½ tsp.
- pepper 6.0 g 3 tsp.
- Spanish smoked paprika (pimentón) 20 g 10 tsp.
- oregano 2.0 g 1 tsp.
- garlic powder 2.0 g 1 tsp.
- T-SPX culture 0.12 g use scale

This particular link never really covered in mold. The rest is covered nicely.
Chuckwagon  

Posted: Tue Jul 19, 2011 03:41

That looks delicious Dave. Do you prefer it to pepperoni? I've got to calculate the salt content though. It seems a little stout. Stan recommends about 2.5% in this type of sausage. Seems like it might require the consumption of more sudsy liquid to help dilute the salt content eh? 😞

Best Wishes,  
Chuckwagon

ssorlih  

Posted: Tue Jul 19, 2011 05:30

Tell me I am wrong but the starting point is 3.3 % salt and then the meat dries 30% ? Is that the way this is calculated?

Ross- tightwad home cook

Chuckwagon
Hi Ross,
Sorry ol' pard but fresh sausage in general, should only contain only 1-1/2% to 2% salt. It gets a bit too salty for consumption at about 3-1/2% and at 5% it becomes unpalatable. Lots of people believe the perfect amount is 2% or simply 2 grams for each 100 grams of meat. However, in fermented-type sausage, the salt content is usually raised by ½ % to total about 2-1/2% in order to protect meat against pathogenic bacteria while lactic acid bacteria are developing during the fermentation process. The salt isolates or binds the “available” water to bacteria. The increase does however, make a noticeable difference in taste. For people with high blood pressure, it is just about the upper limit. To read more about salt, check out this link:

Best Wishes,
Chuckwagon

P.S. 😊 Refer to page 187 in Stan's book, "Home Production Of Quality Meats And Sausages".

Hi Guys,
For those of you who have had to make your own fermentation chambers for this project A, there is a great tutorial with photos from my friend Miroslaw "Mac" Stanuszek at the Sausagemaker in Buffalo, N.Y.
Mac is one of the nicest folks you could ever want to meet. He has worked hard at his job in Research And Development and recently posted some great projects of his own. Check out his modified refrigerator that now ferments his favorite salamis and pepperonis. Here's a link:
http://www.sausagemaker.com/tutorials/chamber/curing_chamber.html
[Ed. Note: As of September, 2015, this has been rewritten and moved to http://www.sausagemaker.com/Articles.asp?ID=293 ]

Best Wishes,
Chuckwagon

Hi Guys,
It has been 10 days since we weighed and checked the relative humidity together. How about hearing from all of you? I sure hope you are still keeping good notes. You'll want to hang on to them for future reference.
We're in the home stretch now. Where did the time go? How about a few photos of your hard work guys?

Best Wishes,
Chuckwagon

**Dave Zac**

Posted: Thu Jul 28, 2011 14:27

I've got RH around 70 this past week and temp at 58-60 with heat wave. Did not weigh last weekend. I am dying to try it 😊

**ssorliih**

Posted: Thu Jul 28, 2011 22:37

G'day Chuckwagon, saw your post this morning but had to go out and earn a living. I pulled all of the sausages out yesterday and placed them in plastic bags in my cold fridge. to give them time to equalize without further drying. Weight loss ranges from 36 percent to about 48 percent. With the moisture content not uniform through the diameter. Not case hardened but not uniformly dry. The tapered ends are more uniform. I had one sausage that was stuffed with the left overs from the three varieties that i made and we ate that last night. We agreed that the taste was good but the texture needs to improve. I have some doubts about the spice levels as we get older our taste buds fade and we need more spice in our food. I have my notes and will make adjustments in the next batch. So far, so good.

Ross

**uwanna61**

Posted: Fri Jul 29, 2011 02:20

Hey all
My project has lost major weight, I’m at day 50 as of today and the end weight sets in at 56 – 59 % weight loss. Another 30 days, I will little smokies. Below are a few pic’s of the project. The texture seems ok, but major weight loss. I did strip the casing off one (see picture) and took a slice. Taste is good, a little on the salty side, but with cracker & cheese not bad! The incubator temperature (inside) reads 52 deg, and the humidity level set at 72%

One question comes to mind: Would the time of year, during hot/ dry days have an effect on curing salamis? I have read that the colder months ending with R, typically are the months to ferment and dry cure salamis.

Sorry for large pic's, but I know CW's gonna want a close up 😊
ssorlih

Posted: Fri Jul 29, 2011 03:41

Mine should look so good!
Hi guys…

DaveZac in Western New York reports: “I’ve got RH around 70 this past week and temp at 58-60 with heat wave.” Dave also said the magic words: “I am dying to try it”. We’ll give him 10 points just for that remark eh? (I’m just worried about the amount of snow you’ll be pushin’ six months from now!)

Ross Hill in Maryland says: “Weight loss ranges from 36 percent to about 48 percent. With the moisture content not uniform through the diameter. Not case hardened but not uniformly dry. The tapered ends are more uniform. I had one sausage that was stuffed with the left overs from the three varieties that i made and we ate that last night. We agreed that the taste was good but the texture needs to improve”.

Uwanna in Vermont reports: “My project has lost major weight, I’m at day 50 as of today and the end weight sets in at 56 – 59 % weight loss. Another 30 days, I will [have] little smokies. Below are a few pic’s of the project. The texture seems ok, but major weight loss. I did strip the casing off one (see picture) and took a slice.

Uwanna also wrote:
Taste is good, a little on the salty side, but with cracker & cheese not bad! The incubator temperature (inside) reads 52 deg, and the humidity level set at 72% . One question comes to mind: Would the time of year, during hot/ dry days have an effect on curing salamis? I have read that the colder months ending with R, typically are the months to ferment and dry cure salamis.

Uwanna, salt is important especially in this type of sausage as you know. However, the content does not change as the salami shrinks and loses moisture. The product only becomes saltier in taste until the end of the procedure, then will mysteriously dissipate somewhat. It is for this reason I use only Diamond-Crystal Kosher Salt; believe it or not, the stuff actually weighs LESS THAN HALF the weight of regular table salt. (Morton Kosher is somewhere in between). For the exact weights, see page 189 in Stan’s book, “Home Production Of Quality Meats And Sausages”.

Table salt often has sodium silicoaluminate or magnesium carbonate added to it to prevent moisture accumulation and caking. Sea salts have magnesium, nitrate, and calcium. Believe it or not, some sea salt (having been evaporated) has so much nitrate in it, that it will cure meat. But it is bitter. Always use the purest stuff you can lay your mitts on.

You asked about the time of year for making this stuff. The old time sausage-makers would certainly have to worry about that, but we’ve made “custom-made”, temperature and humidity controlled atmosphere cabinets that just do not care whether it’s snowing or sunny outside. Storage will be a different matter entirely, as you again start they cycle with a new batch of
fermented sausages utilizing your fermentation chamber. By the way, have you got any suggestions for our next project?

OK guys, let’s approach the next problem. We seem to have a high rate of moisture loss with a month to go. This means one or more of three possible problems:

1. Excessive drying - too fast air velocity - too low humidity.
2. Too fast acidification.
3. Applying a too fast acidifier (wrong culture).

I would strike the possibility of #3 and #2 as we seem to have proper acidification in a long-term fermentation culture of T-SPX. I would, at this point, ask you if you measured precisely 0.6 g. of Bactoferm™ T-SPX. In just about two more weeks, the sausage should be showing some signs of full maturity. Please keep good notes for your next project. Record everything! You’ll never know when you’ll need them.

Look back through your notes. Did you FERMENT at 68°F. (20° C.) for 72 hours in 85% - 90% humidity?
The salamis should have DRIED at 57°F. (14°C.) in 80%-85% humidity. Remember, that Stan’s directions said they could be dry after only 2 months. (extended finishing is 3). Kind folks and gentle people, In about 2 weeks, you’ll have Alyssaandra Salami! The REAL thing! The “expensive” stuff that less than 1% of the people on earth ever taste. Congratulations craftsmen. I’m proud to be part of your project.

Ross, I am just a bit worried about yours with a loss of of 48%. It’s a bit high ol’ pard. Can you post a cross-section photograph? That is just too much moisture loss at this point. With yet some time to go, if I were you, I’d really watch the RH carefully. I believe your air speed is too high and the RH drop may be too much too soon. Don’t dry it out too quickly.

Uwanna seems to have the secret. Your measurement of moisture loss is almost 60%? Uhhh… yup, that’s too high. Did you by chance, have added water with the initial mixture? Ice during grinding perhaps? The sausage does not appear to be overdried, but of course I’m not the one weighing it. I don’t believe it is too dry. That sausage looks just as it should at this point. It’s not done yet and needs some more time for the staphylococci to finishing developing color and taste. This is evidenced by the moisture content although Uwanna seems to think it’s too dry. It looks good to me with the exception of the tiny beads of liquid that form on the newly exposed surface of the meat as a knife slices through it. This indicates a sausage that is just a bit immature – just right at this point. It also indicates that your room temperature is high and the salami has been sliced for twenty minutes. Uwanna, you may wish to cut any air speed altogether as you’ll be in the storage stage soon anyway. Simply open the door for a minute just once a day.

I have to tell you something at this point guys. You aren’t going to believe me. As we approach the finishing time for our project, please note that very few members chose to participate in Project "A". My hat is a Texas-made size 7-3/8 Resistol XXXX beaver – It is certainly off to you men! I congratulate you on finishing a project that most people will never even begin. Sadly, most will never even know the exquisite flavor of the "real" thing! Congratulations men.
You’ve done a superior job. I’m so proud of you, I could just spit! And like I said when we started, “Yeeeee Hawwww”!

Best Wishes Yahoos!
Chuckwagon

uwanna61 Posted: Fri Jul 29, 2011 18:17

CW
Well thank you big daddy with the beaver tail Stetson 😊. This has been an experience, and I did learn a few things on this adventure, it’s all a learning curve and I appreciate your help and patience with the project 😊
As discussed, earlier in the project I believe my fan speed & humidity level may have been off a little on my part. In another month or two I look forward to trying out the project S and a few more pepperoni recipes.

ssorllih Posted: Fri Jul 29, 2011 21:45

When we dry lumber we allow one year per inch of thickness and figure that large timbers never come to equilibrium.
My sausages are stuffed in 60 MM casings. That was somewhat smaller than stated in the original recipe. Will the smaller diameter speed the drying time and do we still have a ripening period to complete?

Ross- tightwad home cook

partycook Posted: Sat Jul 30, 2011 02:43

Fellow sausage makers
here is the update on my project. after 22 days my salami di Alessanddra had a weight loss of 30-32 per cent. after 39 days 39-40 per cent. temp. 57 humidity 75 per cent air speed slow. I also made project "S" and "P" Soppressata had a weight loss of 24-26 per cent after 21 days. I also made the pepperoni I must admit I used 1 1/2 inch fibrous casings. Weight loss after 21 days was between 36-42 per cent, these are in the same curing chamber as the projects "A" & "S" I am still trying to figure out how to post pictures .

John

Chuckwagon Posted: Sat Jul 30, 2011 06:21

Hi Partycook,
Good to hear from you. You got a bit of a late start, but it's ok. We're with you bud! Only day 23 for you, compared with 50 days into the project by others. Perhaps you could slow your air speed and reduce the rate of drying just a bit - (delay the reduction in humidity).

Best Wishes,
Chuckwagon

Dave Zac

Posted: Sun Jul 31, 2011 18:40

My total weight loss is 25% for all for salamis. While the other seem to be running high, mine seems slow at this point doesn't it? I lost 5% over the last 2 weeks. At this rate I have 4 weeks to go. I am not running a fan at all. Should I turn it on very low? for the duration?

Chuckwagon

Posted: Mon Aug 01, 2011 02:47

Dave, it sounds like you are the only one who's clock is ticking straight. I'm still trying to figure out the rapid moisture loss in everyone else's project... (except yours). If I were you, I would slice an end off one sausage and test it. If needed, just continue as planned and wait it out. At this point, there is no need to turn on the fan if you simply remember to open the door each day for just a minute and change the air by waving a magazine or newspaper just for a moment or twelve! Something is definitely working for you! Got any ideas? How come your salami is drying slower than all the rest of us sinners? ... especially that card-cheatin', cussin', law-breakin', shoot 'em up womanizer Ross Hill... otherwise known at "RONGWAY"! Yup, and then there's the dudes on the "wanted posters" -partycook and uwanna! They have already bit into their sausage... they couldn't wait ya know! 😁

I congratulate you on your patience, but we may wish to test one at this point! If it still needs weight loss, we can see what happens in yet another 30 days (if you can wait that long). Keep us posted ol' pard.

Best Wishes,
Chuckwagon

ssorllih

Posted: Mon Aug 01, 2011 03:11

Sliced the end from a sausage this AM and it looks like this.
Ross- tightwad home cook

Chuckwagon

Posted: Mon Aug 01, 2011 03:51
Ross, you are my pal, and I've kidded you all along. However, I do believe that your sausage has been over-dried a bit. It is dark and "rimmed". The splits in the texture indicate too much (rapid) moisture withdrawal. In this particular sausage, the balance of equilibrium has not been satisfactorily achieved. I'm sorry ol' friend. I wish I could report otherwise. But it seems that you have "over" dried your product somehow. I cannot explain the problem because I was not there. For some reason, your project has dried prematurely. On the other hand, unexplained is... DaveZaks sausage... it seems to be right on schedule somehow. I don't know the answer. All I know is that you should not feel badly because Uwanna and Partycook's sausages have also dried a bit prematurely. I cannot explain the reason other than I have in the messages above.

OH, yes... I have my own theories all right. But... I don't know if anyone would be interested.

OK cowpokes! ... If it is one thing we've learned, it is that moisture loss MUST be uniform and very small... little increments of barely detectable amounts - day-by-day... until we see an overall loss that has been prescribed.

Ross, I truly wish I had better news. But, I believe you've dried your project too quickly. Perhaps it is still salvageable although the texture will not be correct. If the center is mushy and the rim is hard, then I'd toss it if I were you and learn from my mistakes. Take a look at all the factors regarding this project. Re-examine every little thing. Something has gone wrong somewhere.... IDENTIFY IT!

Sorry I can't be there to help you my friend. I am still trusting and hoping in your talents. Go for it again my friend.

Best Wishes,
Chuckwagon

ssorllih

Posted: Mon Aug 01, 2011 04:34

I think that I know at least one factor. I have used ice as a cooling source. But ice melts at 32 degrees F and will condense water vapor while doing so. The times when I checked were times when most of the ice had melted. If I had in place a recording Hygrometer I suspect that i would have seen deep drops in the RH when fresh Ice was added to the chamber. I also suspect that there were corresponding drops in temperature. I am going to put a large aluminum pot filled with water in the chamber and put the ice in that and see if I can reduce the collected condensate. 20 pounds of 68 degree water won't fluctuate very much with the addition of a few pounds of ice. I can do this without any sausage hanging and just measure the collected condensate.

At present I have the sausages in plastic bags in the cold fridge and will let them languish there for a time or two.

Ross- tightwad home cook

ssorllih
I am gonna find out if failed salami sausages make good catfish bait. I have seen 40 pound catfish pulled from this river. I have heard that smoked catfish is quite good. Nothing ventured, nothing gained.

Ross- tightwad home cook

Chuckwagon

Ross, Here is a link to my "troubleshooting" page. You might wish to read some of the possible causes: http://wedlinydomowe.pl/en/viewtopic.php?t=4819

[ED Note: That post is included at the end of this summary.]

Stan is in Poland for a while. When he gets back, we'll tap into his smarts and see if we can come up with the answer. Meanwhile, DON'T become discouraged! We'll just "back up and hit it again"!

Best Wishes,
Chuckwagon

Not to worry. I plant a garden each year some years the conditions are very poor and I don't get a good crop. This year the conditions are very good and the crop will be abundant. I will study the trouble shooting page but I suspect that I know what happened.

Ross- tightwad home cook

uwanna61

Ross: In the past, I had this same experience; I blamed mine on poor mixing. Since I pulled out my 20# hand crank mixer, I have noticed a difference in my homemade salami products, just a thought bud.

Quote: Dave, it sounds like you are the only one who's clock is ticking straight

Clock ticking straight? Hold on there cowboy 😊I may have a few wrinkles but I’m rounding turn four, with a full head of steam to the finish line 😊

Took a slice/taste test this evening and below is the result. Inside temperature set at 50 degrees and humidity at 72%
Taste also seems to be a little smoother with a good (no raw) mouth feel, and does not have the salty after taste as I reported a couple weeks back.
Uwanna wrote: Quote: have a few wrinkles but I’m rounding turn four, with a full head of steam to the finish line
Too funny 😂!
And...
Quote:
a little smoother with a good (no raw) mouth feel, and does not have the salty after taste as I reported a couple weeks back.

Wally, I stand corrected and am truly impressed. Splendid sir, just splendid! That is some of the finest definition I've seen. The color is just right and the slightly larger particles of fat are very nice against the solid lean. Very well done Wally!

I'm green with jealousy! (Mine is coming right along and looks pretty good). Tell me, Uwanna, did you include any of the optional spices-herbs in the mixture? What do you think of Allysanndra? Would you recommend it to others? I'm still chewin' on some of my last batch. Your setup looks grand. I can tell you put a little work into your fermenting - drying chamber. Nice going pal.

Best Wishes,
Chuckwagon

uwanna61 🎁
Posted: Thu Aug 04, 2011 22:44

CW
No, I didn’t try any of the optional spice, I went with the standard recipe, thought about it, but opted out last minute.
I would definitely recommend and make again the Allysanndra and try the optional spice next time. The fennel and basil sounds right up my alley for the next batch. I’m lagging way behind on project S, which I’m itching to try, just need to free up my schedule one weekend soon!
There are so many good looking recipes here on the forum; I don’t know which way to turn 😊 Thanks once again CW for your help and taking the time to assist on these projects.
P.S. Any cheddar left, Mrs. CW?

Chuckwagon 🎁
Posted: Fri Aug 05, 2011 02:04

Uwanna wrote:
Quote:
P.S. Any cheddar left, Mrs. CW?

You've got to be kidding! 😄 long gone! Shanks again...
Smokey Wagontrack (Mrs. CW)

uwanna61 🎁
Posted: Fri Aug 05, 2011 03:04
Mother just got home from a business trip to Boston. Sat down to a wedge of Cabot cheddar with Salami Alassandra, and a glass of red wine. Peaceful evening on the patio doesn’t get any better 😊

Chuckwagon
Posted: Fri Aug 05, 2011 05:10

Ross, cowboys have an ol’ saying, “You don’t learn much when everything goes right”. I figure it this way… someday you’ll look back on all this… and probably plow right into a parked car! 😊

Best Wishes,
Chuckwagon

ssorlih
Posted: Fri Aug 05, 2011 05:41

I’ll get back on that damned horse again but not this week. I have some turkey to grind and stuff.

Seasoned some chicken tonight with salt, pepper and coriander. Ground the pepper and coriander seed in a mortar added the salt and mixed it with the chicken pieces and added a handful of flour. Baked them at 400 for about an hour. That temperature carmelizes the dripping.
Ross- tightwad home cook

Chuckwagon
Posted: Fri Aug 05, 2011 10:59

Ross ol’ friend,

Would you allow me to make a few observations without thinking that I am being critical? I’d like to offer my ideas and opinion of what has taken place in your salami. Again, I offer the following, not to be critical in any way, but to help you understand what may have happened.

On June 23rd, you reported RH 90% @ 60°F. – everything was looking fine until… At some point - I’m not sure when, but I suspect about July 9th - the rate of evaporation exceeded the rate of diffusion and created a “dry rim”. I’m sure you will agree there is some evidence of “case hardening”.

On July 9th, you reported, “For all intent and purposes I have the same problem as Uwanna 61. But it isn’t from excess air flow my fan is very small and doesn’t blow on the links. I am just gonna mist with distilled water twice each day.”

The fan, blowing directly on the links or not, makes little difference if the ingress of air exceeded 2 miles per hour (as a prescribed amount of air is being exchanged). Without equilibrium, a normally diffused amount of moisture inside the sausage (I estimate about 20%) was not able to
escape and became trapped inside as diffusion slowed to an almost negligible point, although your fan continued to provide an egress of moist air (provided by condensation of the ice) indicating that everything was normal. Yet, by this time, inside the sausage, the moist interior had become susceptible to *pseudomonas spp.* and other spoilage-type bacteria… some of which are even active at refrigerated temperatures. If I had to venture a guess, I’d say that the spoilage was well underway about the time you reported “blotches” of yeast growth.

Ross, I certainly hope you try again. Please don’t let this setback stop you from succeeding the next time. Once you find the right balance of humidity and temperature, I’m sure things will work out. You’ve got plenty of pals here to help you along. I’m honored to be one of them.

Best Wishes,
Chuckwagon

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**ssorlih** posted: Fri Aug 05, 2011 14:31

Good and valid observations, CW. There is a noticeable taste of spoilage, not rank but to a sensitive palate it is there. I am almost certain that I had wide fluctuations in RH. I am studying on how to make this chamber more temperature and humidity stable.

Ross- tightwad home cook

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**partycook** posted: Fri Aug 05, 2011 18:00

Hey CW,

I am going to try this photobucket site. This one is of the Sopressata after 27 days. The Salami di Alessanddra after 45 days.

and the pepperoni after 27 days. temp 57 degrees, humidity 75-80 per cent. fan is running as slow as I can get it without it stopping. So give me your suggestions and advice. Salami taste as of now a bit bland pepperoni is awesome.

John

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**uwanna61** posted: Fri Aug 05, 2011 23:40

Partycook : I do not claim to be a professional here by any means, but if I had to go out on a limb, to take a guess on these photos. I would say mixing of the salt, seasoning and especially the bactofirm is an issue to the off color, according to the photos.

I have had several small batches tossed into the trash, made the seagulls happy! Finally I turned to “The Art Of Making Fermented Sausage” by Stanley Marianski and along with all the friendly
advice provided from the WD site. I realized that my hand mixing (with latex gloves) was not distributing all ingredients thoroughly throughout the batch.

The process of salami making starts when the salt hits the meat. This is when I pay close attention to details, example: I write down all mix times for each ingredient, salt, spice and cure and mix everything thoroughly. For the fermentation process, I record time and date, while keeping track of humidity and temperature, keeping in mind, the more consistent the humidity and temp levels are, the better chances of success. Then on to the incubation cycle and again keeping notes.

One thing I recently learned and bragged about, was my temp controller being spot on! Well it wasn’t, it was of 4 degrees higher from my baby dial thermometer “which I calibrate regularly” and is inside the (fridge) incubator. As I stated at the top, I’m not a pro at this, but I can say one thing, since joining up with the friendly folks here, I have gained valuable info.

Just my 2cents 😊

uwanna61
Posted: Fri Aug 05, 2011 23:42

Quote: I figure it this way… someday you’ll look back on all this… and probably plow right into a parked car!

Parked car 😐ouch 😐
Ross

I would go out smoke the heck out of a turkey or chicken (in your smoker of course 😊) and when the weather cools down a bit, get right back at it! Heck we could start with project S together? We will make a sopressata at the end of this month when the weather cools down, hopefully? We can do a 5 lb batch to see how it goes.

Chuckwagon
Posted: Sat Aug 06, 2011 00:42

Uwanna wrote:

Quote: I do not claim to be a professional here by any means

Wally, ol’ pard... I MUST disagree with you!
I believe that anyone who can study and heed instructions, learn from others, learn from your own failures, be humble enough to claim he’s not a pro, then turn out a finished product like you have, is indeed a professional! To be quite frank, I’ve examined the close-up photo of your Allysanndra and I believe it is a better quality sausage than the ones in the cover photo on the book, “The Art Of Charcuterie”, by Kowalski from the Culinary Art Institute Of America. Of course, I haven’t tasted it and by no means am I presenting myself as an expert or judge. It is simply my opinion. If one looks closely at the structure of the texture in the solid mass, one may realize why you have indeed made the statement:
Quote: “I realized that my hand mixing (with latex gloves) was not distributing all ingredients thoroughly throughout the batch.”

I totally agree Wally. Furthermore, you wrote:

Quote: “The process of salami making starts when the salt hits the meat. This is when I pay close attention to details, example: I write down all mix times for each ingredient, salt, spice and cure and mix everything thoroughly. For the fermentation process, I record time and date, while keeping track of humidity and temperature, keeping in mind, the more consistent the humidity and temp levels are, the better chances of success. Then on to the incubation cycle and again keeping notes.”

Now, if that isn’t the indication of a professional, what is? Wally, I realize you were very well practiced in making salami when you joined our WD membership. Nevertheless, you were willing to look at the craft anew and open your mind to the techniques of others and new ideas. This, in my opinion, is the reason you will always succeed in anything you put your hand to. You know, Wally, the “pride” in people is a funny thing. It has very much been my observation that many ol’ timers and even folks who “think” they are successful in charcuterie, often present themselves as “above” the techniques and especially the suggestions of others. Many who need help the most, appear to be too “proud” to accept it. In reality, it is those folks who do accept help from others… that most often go on to succeed beyond their wildest dreams. Ok Uwanna, I’ll hop down off the soapbox now. I just thought I’d tell you that I indeed consider you a pro!

Best Wishes,
Chuckwagon

Chuckwagon  
Post: Sat Aug 06, 2011 00:59

Hi Partycook,
Thanks for checkin' in. You said:
Quote: temp 57 degrees, humidity 75-80 per cent. fan is running as slow as I can get it without it stopping. So give me your suggestions and advice. Salami taste as of now a bit bland pepperoni is awesome.

Would it be possible to take a few close-ups (the closer - the better) and still remain in focus. Also, please shine a light directly on the sausage as you photograph it. I would really like to examine the texture and color a bit closer. It sounds like the RH and temp are just about right and if I were you, I believe I'd probably cut off the fan at this point. Please let me know if you think total acidification has occurred. You described the taste of the salami as "bland". Would you attribute it to poor lactic acid development? Perhaps, you are just too used to American "quickly" fermented salami in the stores. Is there a deep and pronounced "flavor" in the salami? Also, please describe the texture.

Best Wishes,
Chuckwagon
Fellow sausage makers,
report on my project "A"Salami di Alessanddra at 52 days. My curing chamber is at 57 degrees, humidity is at 57%, and fan is off. Texture is firm, mold soft covered, casings are well adhered, evidence of oils when squeezed, smells as when it was stuffed, center has a fresher meat appearance, pH 4.9 I have been able to set my temp. and humidity and hold these adjustments. Fan speed is something that I will have to learn more about [although I can adjust it by use of a variable controller] I have a dark outside edge about 1/8 inch thick. Could this be from having the initial fan speed too high? The Salami is continuing to lose weight. The one thing that I did not do was to add the wine.

John

Just checking in,
My "S" & "P" projects were added to the curing chamber along with the Salami di Alessanddra these projects are 35 days old. The Sopressata has a medium-soft texture, mold is soft and well covered, casing is well adhered, evidence of oils when squeezed, darker rim 1/8 inch thick. P.H. 5.0 Odor same as when stuffed. Pepperoni rim slightly darker, color medium brown, you can smell the spices, mold has covered the casings. Casing is separating from the sausage. I used 1 1/2 inch pepperoni casings, also some white mold is forming under the casing. Oils appear when squeezed and seem to be quite even across the product.

John

Just checking in,
Sorry I have been trying to get this post finished but I keep getting interrupted. What was missing from the above posts was the weight loss. Salami di Alessanddra 52 days 44%. Sopressata 35 days 35% pepperoni 35 days 47% Salami si Alessanddra was fermented in my converted refrigerator at 68 degrees 95% humidity fan at 50%. Sopressata and pepperoni where fermented at a later time in my other unit (gutted freezer) using a cold air humidifier (no controller continuous run), fan set at 50% cooling was by frozen water bottles so it varied between 62 and 70 degrees. Still in both Salami examples I have the 1/8 inch dark edge (case Harding ?) could the fan speed have been set to high in the beginning stages. Someone had suggested that the batch was not mixed well. I mixed until it was sticky. All of the above are in the same curing chamber.

John
uwanna61

Posted: Sat Aug 13, 2011 01:53

Quote: I would appreciate it greatly if each of you would write a paragraph with a few of your thoughts about this project so others may benefit from your comments.

What did you learn from the project?

Q - What was the most difficult part of the project?
A - Waiting for the salami to finish curing

Q - Did the final product disappoint you, meet your expectations, or go beyond your expectations?
A - Meet expectations. Next batch will try the alternative herbs & spices.

Q - Would you recommend making dry-cured salami and pepperoni to other sausagemakers?
A - Definitely, but the beginner should acclimate themselves with a fully cooked salami, before attempting a batch of cured salami. Maybe at first try, work with a semi dry sausage.

Q - Do you intend to make more dry-cured sausage?
A - Most definitely!

Q - How would you describe the flavor of Allysanndra?
A - The salami Allysanndra has a good hard salami flavor, has an authentic Italian taste

In my experience:
I have been making salami for a few years. During the beginning generally, jerky, snack sticks and smoke house cooked salami. The past 5 years I have ventured into semi dry and cured salamis, with several failures. I had disappointment after disappointment, to the point I thought one day (after a batch of pepperoni that went south) this is not for me. I tried to wrap my head around this thing called fermented salami. It was obvious there was something wrong with my process! Was it seasonings, not enough bactofirm or cure#2, did I mixing everything, i.e. seasoning, bactofirm and salt in the wrong order? So I took a few months off from salami making.

After a few months went by, the smell of fall air made me stiff’n up (like a buck in rut) as I was walking out to the mail box. This meant one thing “salami season is here! But I quickly realized, I still had a dilemma. my past projects went south where the seagulls hang out. Then I thought, I need three things, equipment, determination, and most importantly,” know how” to get me on the right track!

So I ordered “The Art OF Making Fermented Sausage” read the book from cover to cover. After reading Stanley Marianski’s book, I realized a few things. Don’t always rely strictly on what the recipe says! I thought to myself, if I was a professional craftsman, I could show you my craft, but does not mean I will give away any secrets! Well this is where Mr. Marianski’s book comes in handy. The book spelled out “Art Of Dry Cure Salami” for me. I will admit I had to read the book a couple of times, but hey, there is a lot of valuable information there!
Long story short, as for any craft there is the wrong way and then there is the right way. You may have to turn to a book or ask a lot of questions to gain the knowledge! I prefer the book method, nobody to bother.

Now my soap box presentation 😊

Lastly, even if CW does not want to admit it, he and the friendly folks here on the WD site have stepped up my salami making craftsmanship, to the next level. Thanks guys & gals.

Uwanna

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**Uwanna**

Posted: Sat Aug 13, 2011 02:48

Uwanna wrote:

**Quote:** Lastly, even if CW does not want to admit it, he and the friendly folks here on the WD site have stepped up my salami making craftsmanship, to the next level. Thanks guys & gals.

Thanks Uwanna. Your remarks are very much appreciated. Keep up your great work! We're certainly behind you pard!

Best Wishes,
Chuckwagon

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**Chuckwagon**

Posted: Sat Aug 20, 2011 08:25

Well it looks as if DaveZak and Partycook are the last two hold outs. How does the weight look guys? What is the current temp and RH? You should be getting pretty close to 30% moisture loss by now.

Best Wishes,
Chuckwagon

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**Dave Zac**

Posted: Sun Aug 21, 2011 01:12

I have 3 at 30% and one reached 34% this week. So I decided to cut her open and give it a try. The one one I cut open was the salami I added herbs to. The flavor is very refined with a perfume of herbs. The texture however is still a bit mushy. While I could slice it nicely with a knife, the finger and mouth feel is soft. I expected it to be much more solid.

I put half in fridge to see if a chill would firm it up a bit. The other half went back into the chamber. I have about 58 F, 60 - 65 % RH. I also ran my fan for two days last week. I think that's why I had a jump in weight loss. I gain too much temp however when pulling the outside air into the chamber.
I think I just need more time. I'm encouraged because there is no sign of case hardening at all. Patience is slim right now...I am sooooo close.

Dave Zac

Chuckwagon

[*Posted: Sun Aug 21, 2011 07:25*]

Dave, you wrote:

**Quote:** there is no sign of case hardening at all.

That's music to my ears! Don't be worrying about the soft texture inside. It will harden up, believe me. Have patience ol' pal. I've got one in my dryer (from a previous batch) that is hard as a rock.

Mighty interesting comments about the herb perfumes. I'm glad you decided to experiment with a few spice and herbs. Now you'll know what to do or not do in the future. Mine is kept very simple. Let us know how it progresses Dave. Good luck.

PartyCook, you wrote:

**Quote:**... salami examples I have the 1/8 inch dark edge (case Harding?) *could the fan speed have been set to high in the beginning stages (??)*

That is most probable John. At the onset, it is best not to run the fan at all for the first couple of hours, as we need both higher temperature and higher humidity. At some point, the balance of diffusion and evaporation was upset. Keep in touch and let us know how the remainder turns out.

Best Wishes,

Chuckwagon

ssorllih

[*Posted: Mon Aug 22, 2011 03:36*]

I was telling my older son about my sausage failure and my intention to make catfish bait with it. He said to grind it with liver and stuff it in half inch casings and to use a # 6 circle hook. He said it sould work well. If it does I will send him a batch of it. He said just seal it in a zipper freezer bag and mail it, refrigeration not needed.

Ross- tightwad home cook

partycook

[*Posted: Mon Aug 22, 2011 19:39*]

Hi fellow sausage makers

Here is my report on my salami making:
Salami di Alessanddra it has been 63 days, casing is adhering tightly, sausage is hard, flavor is beginning to develop more, total weight loss is 47%, a PH of 5.0, when squeezed oils within the sausage are evident.

Salami sopressata, it has been 46 days, casing is tightly adhered, sausage is semi-hard, flavor is mild, total weight loss is 42%, a PH of 5.0, when squeezed oils within the sausage are evident.

Marianski pepperoni It has been 46 days, casing is loose on the sausage, I used 1 1/2 inch casings which were smaller than what was asked for in the recipe, flavor is quite good, total weight loss is 52%, sausage is quite hard, PH is 5.0, oil is evident when squeezed.

My curing chamber is at 57 degrees and 75 to 80% humidity, fan is off, I opened the door once or twice a day, weight loss for the salami di Alessanddra has been 3% in the last 11 days. Weight loss for the Sopressata has been 7% in the last 11 days. Weight loss for the pepperoni has been 4% in the last 11 days.

I am really enjoying this Site, and thank everyone for their input, I know my sausage making will improve with your help. My grandson came over this weekend and showed me some things about photo bucket and installed a translator so I can use the Polish Web Site.

John

Chuckwagon  
Posted: Mon Aug 22, 2011 20:25

Good to hear from you John. Sounds like you are right on top of the data gathering process! If I were you, I'd have it gobbled up by now. Those grandsons are pretty special eh? When it comes to computers, they are sharp as a tack. Does he help you with the sausage making? Keep up the good work Partycook!

Best Wishes,
Chuckwagon

Chuckwagon  
Posted: Thu Sep 08, 2011 06:03  
Staphylococcus & Micrococcus Bacterium In Dry-Cured Sausage

In order to have a fully-cured salami flavor, several reactions must take place. Staphylococcus is usually used rather than micrococcus because it is more tolerant to salt and it is anaerobic and safe deep inside the meat of a salami. On the other hand, aerobic micrococcus are active at the surface. Both staphylococcus and micrococcus are able to reduce nitrate to nitrite as both produce an enzyme promoting the reduction of an organic compound. The enzyme, known as a reductase, is called catalase and it protects the meat from oxygen activity. This beneficial trait essentially delays the rancidity of fats. Incredibly, staphylococcus also tolerates low water volume as it creates flavor and aroma in slow-fermented salami. But these guys don’t stop here!
Both bacteria contribute to *lipolysis* - the reduction of fats into free fatty acids (released into the blood and available for cellular uptake), and *proteolysis* - the reduction of proteins into free amino acids. Further, these miracle-working bacteria have the ability to convert the unwanted development of H2O2 into harmless water. Do you remember you High School Chemistry? That is *hydrogen peroxide* dude! 😳I don’t know about you, but I just hate hydrogen peroxide in my sausage! 😄So, let's give *staphylococcus* and *micrococcus* a round of applause and the respect they deserve. The hard-working little guys really do a remarkable job!

Best Wishes,
Chuckwagon

Chuckwagon

Posted: Tue Sep 13, 2011 22:44

Hi Guys,
Well the big day has finally arrived.
On August 20th, DaveZac wrote: **Quote:**While I could slice it nicely with a knife, the finger and mouth feel is soft. I expected it to be much more solid.

...  
**Quote:** I think I just need more time. I'm encouraged because there is no sign of case hardening at all. Patience is slim right now...I am sooooo close.

OK Dave... everyone west of the Atlantic Ocean is waiting to see how the "last holdout" fared.
Slice one open and let's have a look and a taste!
Shucks, I know a couple of guys out here that have been holding their breath since August 20th, just waiting for you so send some photos!
I believe for the weight reduction to take this long (the full recommended time period), you must have had the evaporation/diffusion rate *very* well balanced.
OK pard... let's have a peek! 😄hint - hint

Best Wishes,
Chuckwagon

Dave Zac

Posted: Thu Sep 15, 2011 01:25

'Things are VERY busy right now at work. I haven't had time to check in here let alone slice my salami and take pictures. I am changing the ice daily (twice) and airing out. I will slice it open and take pictures this coming weekend, if not sooner...I promise.

Dave

partycook

Posted: Thu Sep 15, 2011 19:55
C.W. and fellow sausage makers, My Salami Alessandra day 86: My curing chamber is at 57 degrees, humidity at 75%, fan off, I opened the door once or twice a day. PH is 4.8, weight loss 50%, casing is tightly adhered, outer mold cover is even, oils are visible when sliced and squeezed, product seems to be evenly firm across a slice, taste is mild, aroma mild. Salami was fermented under a temperature controlled {fridge}, humidity {green-air} controlled, air {variable speed computer fan}. Curing chamber is also automatically controlled. The biggest negative seems to have been that there is no bright color development. My product is brown in color, not like the color of salami in the deli. It was mentioned that this may have been caused by the initial mixing. I also made projects S and P, which are at day 69.

Project S has PH of 4.8 and a weight loss of 49%. Project P has a PH of 4.8 and a weight loss of 52%. These two projects were fermented with ice bottles for temperature control but used the same type of fan for air control. Even though projects A, S, and P were mixed at separate times there was no bright color attained. Spice was measured beforehand and added immediately after meat was ground. I mixed until sticky then I added the T-SPX culture, which had been mixed with 1/2 cup distilled water {68 degrees} that had been allowed to stand for about 45 minutes to wake up. I continued to mix till I thought it was evenly distributed. I immediately stuffed into casings and then put into the fermenting chamber. I was wondering if I reached the proper safety hurdles even though there was no color development. Well guys, it is time for your input. To answer CWS’ question, I would definitely try again. All the great information and humor make this an excellent site, and once again thanks to everyone. John

Dave Zac
Posted: Fri Sep 16, 2011 01:53

This is the one salami I added herbs to.
This salami is one of three. I didn't cut the other two.
And sliced
The difference in taste between the salami with herbs and one without is actually quite dramatic. I never would have anticipated that. While both are very good, I prefer the plain salami. Both are still a bit softer in texture than I would have expected, especially after 3 months. Weight loss is 35% and current conditions are 55F and 50% RH. Been around 50-55% for the last 3 weeks. I will continue to dry.

Dave

Chuckwagon
Posted: Fri Sep 16, 2011 04:01

Hi Dave,
In sausage making, *anything* that coagulates surface proteins, retards moisture migration. (Strange as it may seem, this often includes the excessive use of smoke). However, it more likely to be caused by any type of smearing. Not to be critical, but I believe you have a bit too much fat content in the sausage. It’s certainly the upper limit of fat allowed in salami for any successful acidification. The reason I point this out is because the center appears to be a little mushy and a “mushy product” is often due to excessive fat – with or without smearing. Also, unless the fat was frozen while adding it to the casing, it could have possibly “greased” the inside of the
casing. This would hinder the diffusion, again possibly causing a mushy center – even though there is no evidence of case hardening. Without excessive evaporation produced by air speed, case hardening would not necessarily be evident. It would also explain the length of time taken to drop 35% of its moisture.

Have you taken a pH reading on the sausage? It would be helpful to know what it is. The pH is ideally the way we should determine when the sausage becomes safely edible.

Best Wishes,
Chuckwagon

uwanna61
Post: Fri Sep 16, 2011 04:18

Partycook
I have read back on several pages of this project and if you would go back to page 15 and review the 3rd reply that CW posted, there I believe would be the answer to your questions.

Quote: oils are visible when sliced and squeezed,

The oil is a sign that would tell me that the fat had broken down early in the process, maybe the meat grinding or fermentation stage.

Maybe the next time you could start with a 5 lb batch on your next go around. Also a smaller batch would be easier to work with. I’m not sure how you mix everything before the stuffin process but I have mentioned this before and say again, mix the batch well. If you think about it, mixing all the seasonings, salt, cure and culture, it needs to be mixed! Adding a ½ tsp of SPX to 10lbs of meat, well that’s a lot of necessary coverage that needs to happen.

I will go out on a limb and say that it sounds like mixing and quick PH drop would be the answer to a couple of your questions. Do you have a copy “The Art Of Making Fermented Sausage”? If not, I would recommend it. The book explains, in slow fermented sausage, the pH drop (5.3 – 5.5) is achieved very slowly, and is not low enough to inhibit the action of curing and flavor developing bacteria. This is important to the texture and flavor.

I would also like to hear more about the fermenting and curing process that you use. Example: Would you ferment in a smoker then in a curing unit, or would the whole process be in one unit? Share your setup with us and on the next run maybe we can help out with a few tips.

Don’t give up, when it goes your way, you will have a major feeling of accomplishment. It is an art and plenty skill that I believe CW mentioned in a past post, most folk would only admire.

Chow
Uwanna
Hi Partycook.
John, you said that your project A has no bright color development. Does this also hold true with the soppressatta and the pepperoni? Did you use the same culture in all. (same packet)?

Sorry it’s taking so long to get back to you tonight. The doorbell keeps ringing. The last pair of critters on my porch were two greenhorns that ordered their steaks “well done”! Eeeewwww! We had to take the time to try and convict the guilty sidewinders, then hang ’em out back in the peach tree! All in all, it took the better part of fifteen minutes! Anyhow, let me do some thinking about this brown color and some of the other problems you describe. Can you get us a close-up enlarged photo? It would really help. I’ll get back to you soon.

Best Wishes,
Chuckwagon

Chuckwagon
Posted: Fri Sep 16, 2011 04:38

Hey Partycook, I think Uwanna and I must have crossed postings at about the same time. Allow me to tell you something I figured out quite a while back... That doggone Uwanna (Wally) is a professional and he KNOWS what he’s talking about. He's made some of the nicest lookin' sausage I've ever seen. And judging by what his co-workers have to say, it must be good stuff! I'd just "ditto" what he mentioned in the above post. The guy really knows what he's talking about. He's had the experience. He was making pretty good salami before he even joined this group of gristle grinders, casing crammers, and meat munchers. 😊

Best Wishes,
Chuckwagon

Dave Zac
Posted: Fri Sep 16, 2011 13:42

Chuckwagon wrote:
Hi Dave,
In sausage making, *anything* that coagulates surface proteins, retards moisture migration. (Strange as it may seem, this often includes the excessive use of smoke). However, it more likely to be caused by any type of smearing. Not to be critical, but I believe you have a bit too much fat content in the sausage. It’s certainly the upper limit of fat allowed in salami for any successful acidification. The reason I point this out is because the center appears to be a little mushy and a “mushy product” is often due to excessive fat – with or without smearing. Also, unless the fat was frozen while adding it to the casing, it could have possibly “greased” the inside of the casing. This would hinder the diffusion, again possibly causing a mushy center – even though there is no evidence of case hardening. Without excessive evaporation produced by air speed, case hardening would not necessarily be evident. It would also explain the length of time taken to drop 35% of its moisture.
Have you taken a pH reading on the sausage? It would be helpful to know what it is. The pH is ideally the way we should determine when the sausage becomes safely edible.

Best Wishes,
Chuckwagon

I have not measured the PH, however have "snacked" as a test for 3 weeks now. Not sick yet 😊.

I followed the recipe exactly by weight and fat was frozen. So what's the fix for a mushy salami? Will it ever dry? I'm thinking I either let it go (I can even hang it outside or in the garage soon) or cut it lengthwise to get it to dry from the inside out. You gotta save me now as I have been concerned about the mushy texture more 3 weeks now.

Dave

ssorlilh   •
Posted: Fri Sep 16, 2011 16:37

I intend to try these fermented sausages again but I think that I will start with summer sausage first and then only in kilogram batches. Meantime I will continue with making the cooked sausage. I saw the Wolfe cubs yesterday and asked them if they were ready for some more sausage and they gave me an enthusiastic yes and giggled when I said I would make some more.

Ross- tightwad home cook

Chuckwagon   •
Posted: Sat Sep 17, 2011 10:17

Hi Dave,
You wrote: Quote: I followed the recipe exactly by weight and fat was frozen.

Ok Dave, that clears up a couple of things. I see no evidence of dry rim or case hardening so apparently normal equilibrium was achieved. That means the sausage should continue to lose moisture, although it could take a bit longer. Rather than cutting it lengthwise, why not allow it to continue drying a little longer and give it a chance to firm up.

You also wrote:
Quote: have "snacked" as a test for 3 weeks now. Not sick yet

I'm sure there has been sufficient acidification to render it safe to consume. This probably occurred some time ago. However, it is the texture at the center with which I am most concerned. I believe the problem lies in excessive fat ratio and content. Initially, did you cut it separately from the lean then weigh it? Here are the specs again:

- 2.0 kg (4.4 lbs.) pork butt
- 2.0 kg (4.4 lbs.) beef chuck
• kg (2.2 lbs.) pork back fat (or fat trimmings)

The 2.2 lbs is 20% of the total and with the marbled fat inside the trimmed butt and chuck, the total volume should only work out to be about 25%. If you look at the cross section in your photo, I think you’ll agree there is much more than 25% fat. I believe, somehow you just simply put too much fat into the sausage. Again, a “mushy” sausage is often due to excessive fat, even without smearing – (which I’m sure you did not do… especially after that last batch of hot dogs you made last spring… har har har 😊😊).

Dave, ol’ pard, the reason I asked about the pH is that when it drops relatively slowly, the action of the curing bacteria is unrestrained. (This is a good thing.) In T-SPX this is the very slow-growing *staphylococcus* bacterium. These bacteria are very sensitive to the acidity produced by *lactobacilli* or *pediococci*. In fact, at about 5.4 they become increasingly less active until they become almost dormant. This is the reason sugar is not usually added to the list of ingredients in dry-cured salami. As *staphyloccus* (or *micrococcus* [added dependent upon desired fermentation curing temperatures]) grow in numbers, they induce the reduction of nitrate into nitrite. It is the nitrite that brings about the nice red color in the meat. It’s hard to tell from a photo, but it looks like the color may be a little pale in your salami also. This could possibly indicate that there was damage to the *staphylocci* by the acidity produced by *pediococci* in the early fermenting stage. So, with increased acidity comes the isoelectric point at about 5.0 pH or less, when the water-holding ability of the meat becomes enervated and the elimination of moisture in the salami actually becomes less difficult. At this “isolectic” point, the sausage is safe to consume and the texture is much more firm. Although checking the pH is the most reliable source of testing the acidity, we can generally assume that the salami is safe and will last almost indefinitely if we keep it cool and protected from light in 60% humidity or thereabouts. (Note that if the humidity is higher, mold will continue to grow on the surface. If the humidity is too low, the sausage will dry out excessively. My point is that the *staphyloccus* (acid sensitive) is responsible for flavor and color development by breaking down not only proteins, but fats as well.

Meat contains about 75% water. Fat contains only about 15% water at most. Thus, water activity (Aw) may normally be lowered faster in a fat sausage than a lean one. For this reason, a sausage containing more fat and less meat, contains less water and should dry faster. However, when the fat ratio exceeds 50%, it is my belief that although the meat may continue to dry, some moist fat will always remain in the center for some time. I would suggest simply continuing drying the sausage as usual until it firms up eventually. This should take place in a humidity-controlled atmosphere of at least 60% or preferably 70% if possible. Placing it in your garage will dry it out and harden the casing, thus preventing any additional diffusion and evaporation. If this happens, the moist inside will eventually spoil and render the salami inedible. Why not give it more time to continue drying in a properly regulated chamber. And next time… lean out the mixture pal!

Don’t be upset and don’t have regrets. Look how much you’ve learned about the process. At the beginning of this year, you didn’t even think you could get this far. Now you know many of the little secrets that will allow you to make a better batch next time. Hey, remember the old saying – nothing ventured – nothing gained. You’ve invested in a terrific amount of knowledge by completing this project. You’ve also gained valuable experience! Have no regrets at all my friend.
Best Wishes,  
Chuckwagon

PS. The only bad thing about not having it come out perfectly is that you have to take a bit of jibing by “motor mouths” like me. Living down a “fat” sausage just might be hard to do! Whew, I’m glad you never saw my first batch! I still refer to it as a “blooey”.

Dave Zac
posted: Sat Sep 17, 2011 14:29

Thanks CW. Although I didn't capture it in my meticulous notes, I believe I weighed out the 1 K fat trim and then trimmed the fat from the butt and added that too. Doesn't seem like it would bring me to the near 40% the pictures seem to capture, but pictures don't lie right?

You are correct about the knowledge gained...can't put a price on it. I'll continue to dry and stay positive that this salami will indeed firm up.

Thanks again for the constructive criticism professor 😊

In the mean time, I think I want to make a pepperoni or two.

Dave

partycook
posted: Sat Sep 17, 2011 19:16

Fellow sausage makers
Uwanna wrote: early fat breakdown could be caused by improper mixing or fermentation. To answer this I mixed until sticky, in the next batch I will increase my mix time. I admit I may have not mixed long enough as the emphasis seemed to be on keeping the mince as cold as possible. Also when handling meat and mixing I also wear gloves. As for the book on the art of making fermented sausage, yes I have it as well as all of Stan & Adam's books. I am in the process of rereading and also using a highlighter this time through. As I have to start and stop way too often.(part of getting old ?)

CW asked if I had used the same packet of culture on all three projects? yes, Packet was about four months old and had been kept frozen since I had received it. I use a #32 grinder, 20# mixer, 20# stuffer. I have two fermentation chambers. One is a 22 cu.ft. gutted freezer with auto heat, air, humidity controls, the other one is a converted frig. that allows me to do the same with added cooling, also can be used as a drying chamber.

I don't know if I should ask Ross for his catfish bait recipe just yet. maybe the pepperoni can be used as nightsticks?

John
Dave
I’m impressed with your comments, don’t get discouraged! As for the fat content, Cw’s comments hold true. With that being said, when I place an order for pork butt from my butcher, usually a 20 – 25lbs order, I will ask the butcher too section the pork, 5lbs per package. This works well for me so that I’m not wrestling with a 10 – 12 lb pork butt. With the smaller 5lbs cut in quarters, this helps with trimming the unwanted stuff and weighing the fat and meat separate.

**Quote:** In the mean time, I think I want to make a pepperoni or two.
Semi fermented Pepperoni? Great idea, check out CW’s “Powder Keg Pepperoni” recipe, you won’t be disappointed. My wife and I had a glass of wine and PKP with cheese last night out on the patio. Had to make a small fire, burrr winter is coming 😊
Chow
Wally

uwanna61

Posted: Sun Sep 18, 2011 18:47

Party Cook
Don’t get discouraged with any suggestions. Believe me when I say, I have had moments when I just wanted to throw the towel in and say the heck with it 😊 Then afterwards, I found myself back at it again. I decided to work with smaller 5lb batch, easier to work with and on the wallet. I mentioned the mixing step as being a key part of several steps to successful dry curing salami, due to this was an issue that I had experienced more than once. Partycook if I my suggest, I would try a semi cured salami as you’re next batch, maybe like Davezac mentioned, a pepperoni.

Here are a few steps that I follow when preparing a fermented sausage \ salami mix.

1. Review and confirm the recipe, I will read a recipe several times to memorize during the start of the batch. I have had moments when I actually forgot a step just because I was in a rush, for whatever reason.
2. I will prepare the seasonings the evening before I start the new batch, just to be prepared and not to take time away from the actual mix when everything comes together.
3. Grind lean meat and fat separate while extremely cold. I typically will grind the meat partially frozen. Immediately after the grind back to the cooler, keeping lean meat and fat separate. This is the time for me to cleanup my area while the meat is in the cooler.
4. Now the mix, I use a crank style 25lb meat mixer. For years I mixed by hand and always had the feeling that I wasn’t mixing everything thoroughly, and not to mention hard on the hands! So I broke down and bought a mixer, it sure has made mixing easier for me. I will start a 10 lb batch by adding the lean meat to the mixer and gradually mix in the fat for 3 minutes; I set the kitchen timer while doing this. Then it’s time for salt, I mix the salt & cure for another 5 minutes. If the recipe calls for a water mix, I will mix the salt & cure into the water. Sometimes the water to salt ratio will not allow for a fluid mix, so then I will gradually add the salt to the meat while mixing. And of course never use water
that has been treated, I use spring bottled water. Now the seasoning, another 3 min with mixer and finally the starter culture for another 4 min, remembering to let the culture wake up with a pinch of dextrose for 30 min before adding to the mix! Note: not all starter cultures require sugar \ dextrose during this wake up process, review and confirm the instruction. The total mix time will average about 15 minutes. Then the mixed meat will go back to the cooler and this is a good time for the cleanup.

5. After the stuffing process is complete I will let the batch hang at room temperature for an hour while my fermenting chamber (usually my smoker) is preheating to the temperature per starter cultures instructions. The sausage maker has great instructions in an adobe print out for each culture used.

6. Fermentation & Curing time: This is when the results of all your work, grinding, mixing and stuffing will be determined of the final product. Keep a close eye on temperatures and humidity for the next several days, making certain that temps and humidity are within specified range. During the curing process, I will double check my curing cabinet (fridge) to make sure the temperature & humidity are set, I rarely trust the temperature or humidity set points of an electronic controller, without a back up instrument inside the cabinet like a thermometer / hygrometer to assure the correct reading are obtained. Commonly both temperature & humidity readings will vary versus what the controllers will read. Keep in mind that if using a refrigerator as a curing cabinet, when the fridge cycles (turns on) this will remove moisture from the fridge dropping the humidity level down. I don’t use any heat (bulb or hot plate) inside the fridge, during summer months, with an average outside temperature. My goal here is to maintain the inside of the fridge, humidity and temperature as stable as possible. The less time the fridge cycles the better, and then I can control the humidity. If there is heat applied inside then the fridge, it will constantly cycle, therefore removing moisture.

If all ground, mixed, stuffed, fermented and cured properly, within a few weeks you should have a curing cabinet with hanging firm salamis, with a mold covering and looking so beautiful it would make a proud grandpa weep 😊

Just my 2cents.
Chow
Wally

Chuckwagon
Posted: Mon Sep 19, 2011 01:01

Sage advice Wally! Explained very well as usual! Thanks for sharing.

Best Wishes,
Chuckwagon

partycook
Posted: Mon Sep 19, 2011 01:57
[img] Here is a picture of my salami di-alessanddra.

John

crustyo44

Posted: Tue Sep 20, 2011 00:48

Hi Wally,
Thank you for your great advise. I now own a hand cranked meat mixer and your explanations certainly covered all the points I was wondering about.
One thing I have to do here in Brisbane and that is to cool the mixer in the deepfreezer as temperatures here sometimes get out of hand.
Thank you for sharing your know-how.
Best Regards,
Jan.
Brisbane.

Chuckwagon

Posted: Tue Sep 20, 2011 01:20

Hey Partycook,
I was just going to answer your photo post (Project A) when "poof"... it disappeared.
Hmmmm... ghosts? aliens? I know it looked good, but did they have to eat the photo too? 😕

Best Wishes,
Chuckwagon

uwanna61

Posted: Tue Sep 20, 2011 01:32

Jan
I’m glad to share salami making tips. This is what I enjoy about the WD site, knowledge and great tips from all folk around the world!
I agree outside temperatures can be a challenge. Our weather is turning here in Vermont and the temperatures are ideal for salami making. Stay cool friend!

Chow
Wally

Chuckwagon


Wow Wally,
I've been going over your last post on the last page (dry-curing tips and procedure). There is some really good info there. I hope folks appreciate the experience in those tips. We really appreciate you putting all that info together. Nice going Uwanna!

Best Wishes,
Chuckwagon

Dave Zac  
Posted: Wed Sep 28, 2011 02:16

I watched a video today of some Italian folks making salami. While I don't pretend to read or speak Italian, I'm pretty sure they were making salami. They packed their casings VERY loosely, then tied and hung.

The process I watched got me to think about how I packed my casing for my salami project and how they are very slow to dry. I packed them TIGHT!. Is there a relationship between how tightly the salami is packed in the casing and how long it takes to dry. Seems like there is to me.

Dave

story28  
Posted: Wed Sep 28, 2011 05:18

**Dave Zac wrote:** I watched a video today of some Italian folks making salami. While I don't pretend to read or speak Italian, I'm pretty sure they were making salami. They packed their casings VERY loosely, then tied and hung.

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Dave

Definitely so. The tighter you pack the sausage, the more difficult it will be for air to flow through the sausage. Another factor might be the fat content or even the size of the fat particles since they contain less water than lean meat, which causes a sausage to dry faster. Another factor could be how finely the sausage is ground. The finer the grind - the more dips and turns the moisture will need to travel in order to escape through the surface

ssorlih  
Posted: Wed Sep 28, 2011 06:12

We have a newly opened supermarket here that has a whole lot of everything including dried sausage and meat in abundance and great variety. Some of the most expensive items are small, short, shriveled, moldy pieces that I am certain are very good but outrageously expensive. That is
understandable considering that they may already be a year old. This is the first time that I have seen examples of quality old world sausage.

Ross- tightwad home cook

partycook

Posted: Thu Sep 29, 2011 00:55

Fellow sausage makers,
Hi Dave, I see your point as far as loosely packing salami, would this allow more air (oxygen) into the product thus increasing a chance of spoilage? Or could they be using a higher percentage of salt? Some of the examples (photos) in our project show small air pockets. One of the reasons I am questioning this is because when we make summer sausage the first place spoilage occurs is where air voids are present, usually caused by loose packing.

John

Chuckwagon

Posted: Fri Jun 29, 2012 11:12

Hi fellow project "A" pals,
Well, it has been a year since we all ground, stuffed, and started "Project A". I am about to "lock" the topic to further comment. Due to the high number of "views" this project has invited, I'll leave it in the sticky section open to reading for all interested viewers.

Project A started as a learning tool for about 350 WD members with only 9 participants. However, with the very valuable knowledge gained through members' experience, the topic has had nearly 20,000 hits in less than a year! Unbelievable! Congratulations my fellows, in posting a most valuable learning resource to the sausage-making public. Your experiences, failures, and successes have paid off remarkably in knowledge gained. I'm sure I speak for many, many others in saying "Thank you VERY much for your unselfish contributions". Well done WD!

Most Sincerely... (with best wishes of course),
Chuckwagon
Are “Fermentation Chambers” And “Curing Chambers” Really Necessary?
...and now, this on “Are Fermentation and Curing Chambers Really Necessary?”

Chuckwagon  
Posted: Mon Jan 10, 2011 04:43  Are Fermentation And Curing Chambers Really Necessary?

Yes, they are. Have you ever cut into a salami and found a gray ring around red meat? This condition occurs when the humidity has been too low during curing, causing quick dehydration (and thus hardening) of the casings - not allowing the correct amount of moisture to naturally dissipate from the sausage as it cures. Trapped moisture can also cause the sausage to spoil. Ol’ Rytek Kutas used to compare case hardening to stuffing a pipe full of sausage. He said, “When the ends of the pipe are welded shut, there is no way for the moisture to escape from the sausage”. It is important to understand there are two atmospheric conditions that we must be able to control if we are to produce dry-cured sausage. They are simply (a.) temperature and (b.) humidity. For fermenting sausage, the ideal temperature range is between 40° F. and 55° F. (4° C. and 13° C.), while maintaining a relative humidity of about 70%, depending upon the sausage being made. Inside a typical refrigerator, the humidity is only about 30% to 40% - much lower than that needed to cure sausages. Many people have tried to maintain 70% humidity by placing a pound of salt into a shallow pan of water. Although, the humidity indeed increases, this method is not recommended as it is not easily regulated or controlled.

Again, dry-cured sausages at the outset need more than 70% relative humidity to start the fermentation process and keep them from drying too quickly. For the first few days (depending upon each recipe), they are placed into a controlled, heated, and moist fermentation chamber to promote fermentation through the development of any number of strains of lactobacilli or pediococci (lactic acid producing) bacteria. Directly responsible for fermentation, the bacteria consume sugar and produce lactic acid, giving the sausage a sour, tangy, taste. The more sugar added, the more “tangy-tasting” the sausage becomes. Hey! Did you notice I used the word taste – not flavor. Actual flavor-producing bacteria are another strain altogether. Later in the process, the humidity and temperature are usually lowered a bit as they are placed into a “curing chamber” for further slow, controlled dehydration. In dry climates particularly, sausages must be cured inside a chamber capable of sustaining a high degree of moisture at varying temperatures. Typically, different “holding periods” are required for dry-cured sausages in an environment of 70 - 75% relative humidity at assorted lower temperatures specified by individual recipes, although the greatest fermentation takes place between 100°F. (38°C.) and 110°F. (43°C.).

Without fermentation and curing chambers, your sausage will probably spoil. Professional chambers or rooms may cost thousands of dollars – not an investment all hobbyists are willing to make. However, using a little imagination and applying a bit of skill, many people transform old refrigerators or freezers into top-quality curing chambers. Some sort of humidifier/dehumidifier with an exterior control must be employed to effectively produce top-quality, fermented sausages, and hobbyists have come up with every sort of contraption imaginable; many are first-
rate! As I was in the piano building business for nearly half a century, for decades, I effectively
used a DamppChaser™ piano humidifier/dehumidifier system, that I incorporated into a modern
refrigerator with all sorts of added shelving and hangers provided for stocking meat sausages. If
you prepare dry-cured, smoked, fermented sausages, bacon, or ham, you must:
1. Purchase a reliable thermometer for constantly monitoring the dry-curing temperature.
2. Purchase a hygrometer for monitoring relative humidity.
3. Build or use some type of “fermentation chamber” (described below)
4. Build or use some type of “curing chamber” (or drying room) having controlled specific
   relative humidity for a specified time period.
5. Install a means of controlling the temperature and controlling the relative humidity in
   your fermentation chamber as well as your curing chamber.
6. Provide for a “storage chamber” or storage room for long-term storage if necessary.

So, what is the bottom line? A small humidifier (use only distilled water please) and an in-line
volt age hum idistat (which senses relative humidity, operating on the same principle in which
we control temperature) must be purchased. An effective method for heating and cooling the
chamber becomes necessary and a “single-stage, line-voltage thermostat” does the trick,
alternately controlling a small ceramic heater and a cooling fan. Mine came complete with a
temperature sensor, a temperature control with a relay switch, and instructions. The line voltage
thermostat solved the problem of having the refrigerator’s controls limiting the operational
temperature from only 32°F. (0°C.) to 40°F. (4°C.). In total, I spent a bit more than I perhaps
should have, but I purchased first class controls and equipment with ability to control a wider
range of temperatures and humidity. Later, I changed the “single stage thermostat” for a “two-
stage line voltage thermostat”, enabling me to control two independent devices – such as the
ceramic heater and a computer fan (used for cooling) or even a small cooler. The two-stage unit
is more expensive, but may be just the item you are looking for. For smaller operations, the
proper thermostat could be as near as your local pet supply store where reptile terrariums are
found. If you wish to incorporate ultimate convenience, a “two-stage line voltage thermostat”
may be just the device you require. Nutone makes a model, and Green Air (www.greenair.com)
yet another.

If you are not inclined to develop your own temperature and humidity controls, search sausage-
making supply catalogs that provide them pre-built and ready to simply plug in. The
Sausagemaker in Buffalo, New York, offers top quality controls and humidifiers, as do other
suppliers. Quality controls for monitoring temperature and humidity may seem pricey, but their
reliability is critical and you really wouldn’t want to purchase a second-rate product that will
break down in time. Some models even have all the controls contained in a single handy unit.
The publication “The Art Of Making Fermented Sausages” by Stanley Marianski, includes much
information as well as some great ideas for building and equipping your own fermentation and
storage chambers. Mr. Marianski has even included a few sources for ordering supplies over the
internet. For the true “do-it-yourselfer”, there are also some great plans available from Phil
Young, a moderator called “Wheels”, at sausagmaking.org. “Wheels” has published them on the
site’s bulletin board free of charge.

At the beginning of the fermentation process, some sort of fan must be used to carry away moist,
stale air as the sausage dries. The moisture content is at its highest as the process begins,
although it usually only requires a smaller computer fan to move air away at about 2 miles per hour. Halfway through the process, depending upon how much moisture is being dissipated, the air speed may be safely decreased to only about one mile per hour. Without this minimal draft being provided, the moisture collecting on the surface of the sausage could become slimy, promoting the growth of unwanted microorganisms. If moisture continues to collect on the surface, the relative humidity must be lowered slightly. The ideal device is a sturdy computer fan, capable of continuous operation. A vast array of them is available at your nearest computer supply store.

Best wishes, Chuckwagon

uwanna61  Posted: Sat Jun 25, 2011 03:29

CW
Over the last couple of years I have made several attempts at fermented sausage and cheeped out on cost and suffered on quality. Then I quickly learned do the job right or you will likely be disappointed. I made up my mind, that this is what I wanted to do, and then put the extra cash in building a homemade chamber out of a refrigerator. Then added a temperature controller with humidistat a fan and nursery humidifier, of course having a passion for salami making, helps along with experience.

ssorlih  Posted: Sat Jun 25, 2011 04:01

The tools of any trade are what make possible the product. You can't make good cheese without a proper means of aging it. you can't properly smoke meats without some manner of a smoke house unless you are willing to sit out and tend a fire while your meat hangs over a smoldering fire for a long time.

Ross- tightwad home cook

Chuckwagon  Posted: Sat Jun 25, 2011 05:32

Uwanna wrote: Quote: of course having a passion for salami making, helps along with experience.

Uwanna, you hit that nail on the head! I believe the passion comes first of all. It sort of wedges its way into one's life as each project becomes better and one's wisdom increases slightly. Many folks will never understand this kind of "passion". I'm happy you've found it. I wouldn't trade it for anything else there is! Keep up the good work pal. 😊

Best Wishes,
Chuckwagon
Ross wrote:

**Quote:** ...unless you are willing to sit out and tend a fire while your meat hangs over a smoldering fire for a long time.

Say there pard, that's not a bad idea at all, especially if you happen to have a fishin' pole in your hands! 😄

Best Wishes,
Chuckwagon
Hi Sausagemakers,

I put together a troubleshooting list for those of you having problems making fermented sausages. If at first you don't succeed, throw a temper tantrum, use the salami for a door stop, and try again! Here is a list of common problems and their possible causes. Most people think there are only three Bactoferm biocultures. Actually, there are many, each with a specific job to do. For a description of each, read Stan Marianski's book "The Art Of Making Fermented Sausages". If you still have trouble, shoot me a message and I'll try to help although I am surely no expert.

Best Wishes, Chuckwagon

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**Troubleshooting Guide for Fermented Meats**

*Information based on experimentation by Chr. Hansen, Manufacturer of Bactoferm™ starter culture.*

See complete source of info here:

Vol. 1 Fermented sausages with Chr. Hansen starter cultures


redzed 2015-01-15

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**Slow acidification**

Frozen culture allowed to thaw and subsequently held too long before dispensing into meat.

Microorganisms exhaust nutrients in packet/can, reducing the pH resulting in a lower culture activity.

Environmental temperatures/humidity during fermentation inconsistent with recommended culture optimums.

Secondary growth in meat of contaminant microorganisms producing components that buffer pH drop.

Prolonged storage of the meat mixture at cold temperatures resulting in extended lag phase at the beginning of the fermentation cycle.

Cheese in product may contain phosphate that buffers pH drop; it also has a tendency to absorb moisture from surrounding meat.

Sausage entering the smokehouse/climate chamber colder than normal, for example by using very cold meat, which may prolong the lag phase of the starter culture.

Spice formulation adjustment that either decreases acid stimulation or inhibits the culture.

Excessive salt or cure addition that inhibit starter culture.

Culture contact directly with curing components may inactivate the starter culture.

High fat formulation that reduces the moisture content.

Large diameter product giving slower heat transfer.

Rapid moisture loss in product.

Insufficient carbohydrate source added to sausage mixture.

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**Fast acidification**

Temperature/humidity is higher than normal.
Spice formulation adjustment that favors the culture.
Excessive water addition.
Product delayed prior to entering the smokehouse/climate chamber resulting in higher initial temperature.
Leaner product giving more moisture and lower salt-in-water.
Change of meat (from beef to pork) in recipe.
Smaller diameter product processed at high humidity.
Initial meat pH lower than normal.
Wrong combination of carbohydrate.
Too slow drying that allows longer acidification.

**Inconsistent acidification**
Inadequate distribution, resulting in hot and cold spots in meat mixture.
Inadequate distribution of culture, salt, cure, spices, dextrose.
Diverse initial product temperature.
Stored product and directly processed product in same climate chamber; culture activated in stored product resulting in a faster fermentation.
Products with different spice formulations, meat components, casing diameters, pH or water/fat content.
Uneven temperature/humidity in the climate or fermentation chamber.
Uneven humidity in dry room causing different drying rates.
Too low acidification temperature.

**No acidification**
Culture not added.
Culture inactivated by direct contact with salt, cure components, or heavily chlorinated dilution water.
Non-compliance with recommended handling temperatures after thawing of frozen culture.
Insufficient carbohydrate added to sausage mixture.
Excessive salt content.
Antibacterial agents added to meat mixture (preservatives, chemical boiler treatments via steam, antibiotics in meat).
Culture exposed to high temperature during transportation or storage.

**Too low final pH**
Failure to monitor acidification.
Excessive carbohydrate source.
Insufficient heat processing to retard fermentation (cooking procedure).
See also Fast fermentation.

**Insufficient moisture loss**
Excessive humidity.
Excessive air speed and/or too low humidity sealing surface pores giving case hardening/dry rim. No moisture migration from product.
Excessive smoke initially that coagulates surface proteins retarding moisture migration. Slow drying, too high pH.
No acidification.
Smearing (during grinding) preventing water loss.
Casing greasy due to fat melting commenced. Water outlet potential through casing greatly reduced.
**Too much moisture loss**
Excessive drying, too fast air velocity, too low humidity.
Too fast acidification.
Applying a too fast acidifier (wrong culture).

**Souring of product, post-processing**
Insufficient heat treatment to destroy microorganisms (cooking process).
Residual carbohydrates in excess that permits secondary fermentation.
Excessive moisture and residual carbohydrates in non-cooked product.
Insufficient drying.
Temperature abuse post-packaging.

**Off-flavor**
Microbial contaminants either growing during fermentation or post-packaging.
Use of spoiled raw materials (meat).
Poor sanitation post-processing.
Chemical contaminant.

**Discoloration/green or gray coloration.**
No addition of staphylococci.
Oxidation of meat pigments via microbial contaminants, metal contaminants.
Exposure to sunlight.
High pH.
Excessive peroxide-forming bacteria.
Too low amounts of nitrate/nitrite added.
Too fast acidification.
Spoiled raw materials.
Chemical acidifier added.
Too low fermentation temperature.
Too much sorbate in the casing.
Growth of yeast on the surface.
Trace metals (unclean salts).
Grey/brown rim due to high smoking temperature.
Smearing preventing water loss giving spoiled (grey) center.
Excessive air speed and/or too low humidity, sealing surface pores giving case hardening/dry rim. No moisture migration from product giving grey center in sausage.

**Mushy product**
Over-working at mixer, chopper or grinder.
Excessive fat extension.
Insufficient salt level or no salt added.
Spoiled raw materials.
Proteolytic microbial contaminant.

**Slimy, gassy-product**
Yeast or heterofermentative lactic acid bacteria contamination in package post-processing.
Excessive moisture content.
Inadequate smoke concentration at product.

**Greasing (fat melting)**
Excessive heating rate (cooking process).
Excessive fermentation temperature.
Unstable meat mix, low-binding meats.
Overworking raw meat mixture.

*PS. If you are still having trouble, send a personal message anytime.
Best Wishes, Chuckwagon

Dave Zac

Posted: Thu Jul 29, 2010 16:06

Thanks Chuckwagon. This will be most helpful indeed.

brewmaster

Posted: Tue Mar 29, 2011 16:26

Hi, I am currently 9 days into a large batch (45lbs) of genoa salami (40% beef/60 % pork)....used bactoferm & tspx, good sanitation, humidity & temp control, now at 54F & 75% humidity....Sausage appears fine, slowly shrinking, nice white coat, however, I detect a slight smell of ammonia when I open the doors of the fermentation chamber. Is this something to be concerned about?

Chuckwagon

Posted: Thu Mar 31, 2011 02:56

Hi Brewmaster,

Great question!
Molds are aerobic. Some folks have stated on other boards that molds will grow beneath the surface. They absolutely will not. Any High School biology or chemistry textbook will reaffirm this. In many instances, molds get the blame for the second type of bacteria - the spoilage microorganism. White molds on sausage (Penicillium nagliovense or chrysangenum or Penicillium roqueforti or camemberti on cheese) have always been seen as desirable growths as they help to moderate the drying process by preventing oxygen from reaching deep into the sausage. Molds also oxidize lactic acid as well as other acids. This action produces ammonia which just happens to increase the pH.

Now don’t be too tough on molds. As they consume oxygen, they produce catalase, which reduces lipid oxidation and rancidity of fat. Last but not least, they metabolize lactic acid to increase pH.

Some time ago, I answered this same question on another sausagemaking board. I just about started World War III with my answer. I asked author Stan Marianski to clear the air by posting a response. He wrote the following message to sausagemaking.org: (based in England).

Stanley Marianski

Hi Chuckwagon,
I have visited your Sausagemaking Forum and must admit that I am very impressed with the quality of articles that are posted on a daily basis. The reason I have decided to write The Art of Making Fermented Sausages was not to compile sausage recipes but to provide some light on theory of meat fermentation as it applies to making those products. The main problem was to simplify related to the subject meat science and to make it readable to an average person. Too much theory and technical terms would make the book too complicated. Because of that some statements were often generalized and one of them has created some controversy. I have forwarded the question to the well known authority on the subject but as I have not received a reply yet so I have decided to check my library to see if I can find an authoritative answer.

In my personal opinion the most qualified person on the subject of fermented meat products is Professor Fidel Toldra, Ph.D from Instituto de Agroquimica y Tecnologia de Alimentos, Burjassot (Valencia), Spain. He has authored a number of technical books on the subject of meat technology and making fermented and dry products.

The question was:
“similarly to yeasts, molds oxidize lactic acid and other acids, and produce ammonia which increases pH”.

In Meat Science and Applications, Chapter 23, Meat Fermentation Technology, page 550, Professor Toldra writes:

4. Mold : The contribution to flavor is mediated by the activity of lipolytic and proteolytic enzymes. Also, the ability to metabolize organic acids resulting from lactic fermentation causes a decrease in the acidification level and tangy taste. This is also the result of deaminase activity that generates ammonium from amino acids. The application of nontoxic strains protects the product from the adverse effects of the implantation of mycotoxigenic molds.

My note: deaminase - an enzyme that releases the amino group from a compound.

On page 553,

3. Flavor: The presence of yeasts and molds in fermented sausages contributes to the fermented flavor. The lipolytic enzymes contribute to flavor by generating carbonyl compounds. In the presence of oxygen, molds and yeasts do not only form flavor compounds but also oxidize lactic acid.

In his book Dry-Cured Meat Products, page 128, Professor Toldra writes:

The influence of molds depends on the mold strain that grows on the surface and the type of casing used (Toledo et al. 1997). The total volatile basic nitrogen increases towards the end of the process, especially during drying, as a result of ammonia production by deamidase and deaminase activity, enzymes typically found in molds and yeasts. The neutralization of acidity produces an increase in pH and favors the action of both microbial and muscle exopeptidases.

Another expert, Jim Bacus, Ph.D, American Bacteriological and Chemical Research Corporation, Gainesville, Florida, United States, writes in his book Utilization of Microorganisms in Meat Processing:

Molds and Yeasts. Page 80 – As the mold develops and uniformly covers the surface, enzymatic action on the fats and proteins can influence the flavor and aroma that is distinctive of the product. Large
drying chambers can have a pronounced “ammonia aroma” resulting from proteolytic action on meat proteins.
P.S. If I had quoted such sentences in my book, it would have made it unreadable to the general population, so I have come up with my simplified one sentence version.

In July The Art of Making Fermented Sausages was revised, edited and published by Bookmagic, LLC. The new ISBN: 978-9824267-1-5.

Sincerely,

Stanley Marianski

______________________________

Brewmaster,
If you care to view the fireworks, you may see it here: http://forum.sausagemaking.com/...light=ammonia

If you click on to read this response, I only ask that you would review all four pages of the conversation so you don’t take me for a fool. The first two pages were filled with quite a bit of chiding and a bit of sarcasm. On the third page, my response is finally justified – thanks to the efforts of Stan Marianski. However, I just knew that I could detect the odor of ammonia – just as you have! I stuck to my guns and my trust in our very own “Seminole” (Stan Marianski) who re-affirmed my written responses and conclusions. Indeed, he left “egg on the face” of the original doubter – who, by the way, later wrote a letter of apology.
So, Brewmaster, I hope this helps to answer your question. Again, welcome to the forum and write in often.

Best Wishes,
Chuckwagon

Dave Zac


So I’m changing the ice in my chamber this morning and I detect a slight ammonia odor. I vaguely remember reading about this topic on another forum and decided not to worry until I have a chance to jump on the internet and check it out.

Low and behold all the research has been done for me. Great thread by the way! I feel better too 😊

Keymaster

Posted: Mon Jan 02, 2012 00:46

I got my first waft of ammonia today. This won’t make the salami taste like ammonia will it? My wife enjoys Brie cheese and once in awhile she will bring home a loaf that smells and tastes like ammonia, I won’t touch that stuff. I did read all of the threads from above and hope I did not miss the answer to my question.

Thanks,

Aaron
Chuckwagon

Posted: Mon Jan 02, 2012 01:43

Hi Aaron,
You asked: Quote: This won't make the salami taste like ammonia will it?

Not at all. The mold is having a good time oxidizing the lactic acid (et al). This normally and naturally produces ammonia, increasing the pH. It will not affect the taste of the sausage whatsoever. From what I can see, you're going to have a wonderful, tasty, dry-cured product. You've almost done all you can do. Keep an eye out for any discoloration. If you find any, photograph it and post it immediately. There are steps you can take to remove the discoloration (pathogenic microorganisms). Relax Keymaster, you're lookin' like a champ!

Best Wishes,
Chuckwagon

Keymaster

Posted: Mon Jan 02, 2012 02:04

Thank you for your response Chuckwagon, I feel better now!!

Aaron