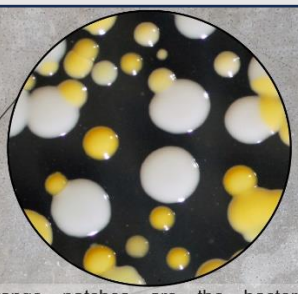
GUIDE TO MOLD

A Visual Guide to Salami Microbiology

Surface Microbes

The dusty surface of your salami is a microbial landscape of **mold**, **yeast**, and **bacteria**. The magnified view below shows the fuzzy white mycelium of mold surrounding patches of yeast and bacteria.



Orange patches are the bacterium ***Staphylococcus xylosus*** (orange colonies above). Unlike *Staphylococcus* ("Staph") *aureus* strains that can cause food poisoning, this is a desirable species that is often added to salami for flavor and aesthetics (see 'Internal Microbes'). Its color ranges from orange to white.

The white mold ***Penicillium nalgiovense*** (fuzzy colonies above) and the yeast ***Debaryomyces hansenii*** (shiny circles) colonize the salami surface and prevent contamination by undesirable microbes. Sticky and smooth spots are where yeasts are abundant. Fuzzy and dusty spots are dominated by mold. During the aging process, these fungi produce musty, mushroomy, and yeasty aromas.

Internal Microbes

The meaty inside of a salami is packed full of **lactic acid bacteria** (magnified 1000 times in photo below). These bacteria produce lactic acid during fermentation, creating a hostile environment for spoilage microbes. This process preserves the meat. The amount of lactic acid produced also affects the level of tartness of the salami.

Various ***Staphylococcus*** species, including ***Staphylococcus carnosus*** and ***Staphylococcus xylosus***, may also be present in the internal part of salami and help retain deep red color of the meat. Both the lactic acid bacteria and *Staphylococcus* species produce typical salami flavors, including green, buttery, floral, and cheesy flavors.

INTRODUCTION TO MOLD

Have you ever heard the phrases,

“Eeewww why is that moldy?” or,

“It must be off!” or

“You can’t eat that; it will give you food poisoning.”

These are all comments we have heard day in and day out in our industry from people who have no understanding about the normal development of mold on saucisson and all dry aged smallgoods.

This short guide will help demonstrate and answer these questions and hopefully add some insight into the amazing world of mold development on dry aged products.

Let me start by definitively stating that saucisson **needs** mold to age properly and is a normal developmental process in the manufacture of smallgoods. Mold helps us, as the manufacturer, to understand the environment that our smallgoods are aging in. Is there too much humidity? Is it too damp? Are the products drying too quickly? Is the environment hygienic enough? These are just some of the questions that mold development helps us answer. The right environments create healthy mold.

Healthy mold growth can be safely consumed and is in no way harmful to a person’s diet. In fact, quite the opposite. Think soft cheeses like blue vein Gorgonzola or a Camembert cheese with that delicious moldy outer rind. Or harder cheeses like Parmigiano Reggiano, where top chefs worldwide add the hard rind of Parmigiano to their sauces or soups which adds astronomical flavour. In countries like Italy and France, the mold development is more important than the final product. If the saucisson does not come out, looking like it needs a shave with a lawn mower, it can instantly be rejected. In saying that, smallgoods can also be rejected for developing the wrong types of molds that could be harmful.

Mold growth on smallgoods adds flavour to the final product as well as keeping bad bacteria at bay and helps sway unwanted pests like lava laying flies. Mold development also keeps the smallgoods from drying too quickly and creating a “double skin”.

Everyday when we inspect our aging rooms, we enter them as if like a scene from National Geographic and David Attenborough quietly whispering in our ear, “Wow these look amazing, the more mold the better!”

EXAMPLES OF MOLD ON OUR SAUCISSONS

Penicillium Nalgiovense

This edible mold grows naturally when the environment for drying saucisson is optimal. The colour of this mold ranges from dusty white, blues, greens, grey, brown, and even black. The variation in colour occurs as the environment the saucisson is subjected to changes, for e.g., higher humidity or water activity. These molds are naturally formed during the aging process and delicious to eat, enhancing the flavour of the saucisson, but can be easily removed by taking off the saucisson outer casing if desired.

White

20x magnification

Green

Grey- Brown- Black

Blue

Staphylococcus Xylosus
“The Maestro of molds”

These orange- yellow crusts are a good sign of deliciousness and safe to eat. The presence of this mold is a sign of excellent aging conditions and aids with the development of a high concentration of salami flavour. Xylosus is the hardest mold to grow as it contains 5 different types of bacterial species, 2 molds and 1 yeast. This mold is the most desired amongst professional artisanal smallgood manufacturers rather than the white mold or penicillium nalgiovense so often seen.

Orange- yellow

20x magnification

Orange- yellow

This picture shows a perfect example of one mold “fighting” or over taking another. You can see the blue mold, or penicillium nalgiovense is prevalent, but on closer inspection the most desired orange- yellow mold, staphylococcus xylosus, is slowly developing underneath and will soon take over.

SUMMARY

In Summary, why do we want mold?

The first reason we need mold is to protect the saucisson from any competing molds or bacteria growth during the drying process. Inoculating our saucisson with penicillium nalgiovense, (good mold), drives off any potential bad mold that may exist in the environment. Our mold army vanquishes any undesirables through sheer numbers!

Another key function is to regulate the drying of the saucisson. Mold keeps the surface of the saucisson from drying too rapidly or slowly, making for a ready-to-eat, high-quality, finished product.

Finally, the mold on the exterior of our saucisson contributes to the overall flavour by mellowing out the acidity produced during fermentation. We could cure our saucisson differently and not use mold, but it would drastically change our product and wouldn't taste as great as it does.

“My saucisson doesn't look like the others I ordered, why?”

Some manufacturers use milk, artificial colours, and rice powders to colour the outer casings of saucisson. These are always consistent and white, but they aren't **natural** like the molds we love to develop. Although we use the same species of mold for inoculating our saucisson, we can't say that it is going to grow the same way each time.

Part of creating a natural product means we allow nature to unfold without too much huma interference.

With each batch, we watch the mold change and adapt to its environment and the evolving nature of how it grows. We control it as closely as we can and monitor it if things get a bit too wild, but we still find that there is natural variation.
Which is why there is such a range in colour and appearance, from white to green to shades of grey, brown, and blue.
The black mold especially, can seem off-putting, but it safe to consume, and again, is part and parcel of the wonder of dealing with a natural product.

Remember, mold is one of the key ingredients to amazingly tasty smallgoods and a necessary part of smallgood manufacturing. Without it you run the risk of developing an inferior product and introducing bad bacteria into your facility.

Our Quality Assurance team is always available to answer any further questions or enquiries.