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# PRODUCING HOME - MADE SAUSAGES FOR ONE'S OWN NEEDS

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## SUMMARY

*The paper describes the procedures of producing home-made sausages in household. Recipes for producing sausages differ depending on the tradition of the area where they are produced.*

*Still, regardless of the kind of sausages, it is necessary to hold on to basic normative of production during their production, for the purpose of quality and propriety of a final product.*

**Key words:** sausages, production, household

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## INTRODUCTION

Sausages are assigned to the most numerous category of meat products, and they are produced by stuffing natural or artificial casing by a mixture of different kinds and quantities of chopped meat, fat tissue, thin skins, organ meats, remains of connective tissue and extra ingredients. In our country we produce and put to circulation long-life, medium-life, scalded, baking sausages and sausages for cooking (Živković, 1986; Pavičić, 2003; 2004; Majić and Filipović, 2006). But, when we speak about producing home-made sausages for one's own needs, then we use a somewhat different sausage classification. According to the stages of processing and a degree of keeping quality, we differentiate fresh, cooked and long-life sausages. Fresh sausages are that kind of processed meat product where the processing stage was finished by filling the casing with stuffing, that is, after the short exposure to smoke, which improves creating a better smell, taste and keeping quality of a sausage. Keeping quality of fresh sausages is up to three days, and of those shortly smoked up to ten days, provided that until being used they are kept in a refrigerator. They should be thermally processed by cooking or baking before serving. Cooked sausages or sausages from organ meats are meat products to which processing stage has finished after the thermal processing (cooking) that is, cooling and short exposure to the acting of cold smoke. Keeping quality is up to seven days, and if they were shortly smoked, then up to 14 days, provided that until being used they are kept in a refrigerator. Both kinds are mainly sausages produced in smaller quantities and they are quickly used for consummation. If it is about producing larger quantities of sausages for one's own needs during longer period of time in a year, we decide to produce long-life sausages. After stuffing the casing and shaping pairs, we will expose such sausages to longer activity of smoke and relocate them to a special room for drying i.e. ripening for 60 or more days depending on the bulk of a sausage (Pavičić, 2004).

There is a long tradition of producing different sausage-making products in Croatia. Most of these products produced in plants of meat-processing industries originate from the household productions. Namely, industrial manufacturers have mastered such production in their trying to enable consumers to consume such products all-year long. But, an average consumer who believes that home-made products are better rather consumes sausage-making products produced in households (Majić et al., 2006). One of the reasons is also the fact that by producing sausages in households we can determine by ourselves, for example the kind of meat and percentage of fat in the stuffing, as well as kinds and quantity of spices, creating in the process an individual taste (Gahm, 1996;

Perry and Reavis, 2003). But, regardless of the recipe i.e. the kind of sausages, we have to stick to basic normative of production that affects the final quality and health safety of products.

## INGREDIENTS FOR PRODUCING SAUSAGES

Sausage production is a sequence of continuous actions, in which process each one of them is equally important for successful production. During the first production of sausages in household, it is recommendable to weigh and write down all the ingredients in order to apply the same receipt with the next production, or even to improve it. In the first production of sausages, smaller quantities of ingredients should be used, but their proportions should be tried out more frequently. That is the best way to find the adequate receipt (Gahm, 1996).

The main ingredient of sausages is certainly meat, which implicitly includes pork in traditional comprehension of home-made sausages, although other meats are also regularly used (Livingston, 1998). Namely, pork meat is the most appropriate for producing sausage-making products, because almost all the parts of carcass can be used for processing to different kinds of sausages. Still, when using pork meat for producing sausages after the traditional pig-slaughter, shoulder butt, meat parings after processing pig halves, part of fresh bacon, and one shoulder and/or leg are used more often because other parts of carcass are used more often fresh or dry-cured for consummation (Pavičić, 2004).

The meat must originate from healthy animals. Therefore, if the sausages are produced after the pig-slaughter, the meat should undergo veterinary sanitary inspection so we can be sure that it isn't infected i.e. invaded by certain agents of infectious and/or parasitic diseases which can transmit to people by pork meat (Schmidt, 1996; Pavičić, 2003).

Except for meat, the other ingredients of sausages are spices, salt and sugar. During the preparation of stuffing, they are added in a small proportion and they don't significantly affect the volume of stuffing for filling in the casing, but they do have a certain meaning for creating a specific taste, smell and color of sausages (Kobler, 1999; Pavičić, 2004). Owing to the content of essential oils, certain spices (pepper, garlic, etc.) act bacteriostatic, even bactericidal to certain species of nonsporogenous bacteria. Garlic manifests a certain antibacterial effect to aerobic sporogenous bacilli (Živković, 1986).

During the production of sausages in certain areas of our country, salt, black pepper, garlic and ground red pepper are used the most. Except for the listed spices, sage, thyme, marjoram, rosemary, laurel and parsley leaves, nutmeg, ginger and allspice are also used (Livingston,

1998; Pavičić, 2004).

After the meat, salt is one of the most important ingredients, without which sausage producing would be unimaginable. Its function is to give a desirable taste to sausage and prevent the development of microorganisms, and by smoke it affects creating organoleptic traits of a long-life sausage. Sugar is also an important ingredient, because it is a part of the process of creating a desirable color of stuffing, it helps salt break through the meat more easily, and the presence of sugar corrects the saltiness of sausage to a certain extent (Pavičić, 2004).

When we discuss about sausage ingredients, a question is made about the proportion of fat tissue in stuffing, even more because of the common fact that over consumption of fats of animal origin isn't justified for health reasons, because it causes human obesity and vascular diseases. But, we should mention that fat is a traditional and necessary ingredient in a sausage because it helps with integration of individual ingredients, and it is a part of creating a specific sausage taste. Except for that, without a certain quantity of fat, a sausage dries faster and becomes too solid, especially if it is stored for several weeks in a special room for producing long-life sausages. Still, we should be careful not to put excessive quantity of fat (over 30%) in sausages, because a portion of 10 to 20 percent of fat tissue is necessary for the production of home-made sausage (Gahm, 1996; Kobler, 1999; Perry and Reavis, 2003; Pavičić, 2004).

## CASINGS FOR PRODUCING SAUSAGES

The basic characteristic of sausages is a casing, whose basic task is to keep the product in shape and size that is characteristic for a certain kind of sausage. Its role is to protect the sausage from external effects, it enables evaporation of water from the stuffing and breaking through of smoke in the stuffing. Except for that, the casing has to be impermeable for fat (Živkovic, 1986).

Casings are divided into natural and artificial, in which process natural casings are used the most for producing sausages for one's own needs in household. For this purpose until recently natural casings of pig origin were used after the traditional pig-slaughter. The situation in this regard has significantly changed nowadays, because in Croatia there are several producers of natural preserved casings, which offer their products mostly on main town market-halls, where there is the greatest circulation of people. It should be emphasized in this matter that all kinds of natural casings come to sale preserved in salt and based on calibration they are classified to several groups. Under caliber, namely, we imply diameter of fresh inflated casing in millimeters. We cut purchased natural preserved casings in parts long 1 to 1,5 m approximately and we wash

them out under the stream of lukewarm water to remove extra salt. Then we put them in a pot with cold water and leave them soak for about half an hour. After that, we take one end of the casing, put in under the nozzle of a pipe and we thoroughly rinse out its inside (Gahm, 1996). Casings well-washed from the salt are then once again before stuffing soaked in a 5 percent solution of acetic acid, so that on one cup of water we add approximately one table spoon of vinegar. The mentioned solution softens the casing and makes it more transparent for stuffing and final shaping of finished pairs of sausages. Except for that, soaking the casing before stuffing in acetic acid prevents the appearance of mould on sausages during dry-curing, i.e. ripening. We leave the casings in acetic acid until we are ready for stuffing, and in the process exactly before the stuffing we shortly rinse them out once again in clean water. Except for acetic acid, we can also use other kinds of organic acids which are not harmful to human health. Therefore, for the described purpose we can use a water solution of citric or lactic acid in the same percentage as the solution of acetic acid (Pavičić, 2004).

## COOLING AND CHOPPING UP OF MEAT

The meat which we want to use for the production of sausages should be previously cooled. Therefore it should be refrigerated for at least 18 to 24 hours on  $-1^{\circ}\text{C}$  to  $0^{\circ}\text{C}$ . The temperature of  $3-4^{\circ}\text{C}$  in the inside of meat is achieved in that way, which is a precondition for producing quality home-made sausages. Only after these conditions have been satisfied, we can proceed to the first stage in sausage production, and that is chopping up the meat. The meat should definitely be examined, and if necessary, bones, cartilages and sinews are detached (Kobler, 1999). We cut cooled meat in smaller pieces and chop it up in a machine for small chopping. Depending on the way of preparing some stuffing for producing sausages, we can

▼ Figure 1. Chopping up meat



▼ **Figure 2.** Grinding of meat

use different diameters of the openings of cutting panels, in which process we use smaller diameters for fine chopping and larger diameters for rough chopping. Nowadays, electric machines are used more often for grinding meat, especially in households which produce larger quantities of sausages for their own needs. Electric food processors can be used for the same purpose, especially for making a fine stuffing (so called prata) while producing some kinds of fresh sausages (Predika, 1983; Livingston, 1998; Pavičić, 2004).

### PREPARING THE SAUSAGE STUFFING

After the small chopping, spices are added to the stuffing in quantities determined by a receipt for making certain kinds of sausages. While adding spices, the mixture should be well mixed for 30 minutes in order to equally bind up all the ingredients in the meat, that is, that the stuffing becomes homogenous and firm. After the mixing, the prepared mixture should be left for 1 to 2 hours in a cool and airy room so that the spices can break through the meat and enable better taste of a final product. Except for that, during the resting, the stuffing will tighten even more in a pot, and by that become firmer and more appropriate for filling the casing. Before filling the casing with the stuffing, it is recommendable to taste the stuffing by shaping a smaller quantity of stuffing in a hamburger and grilling it. If necessary, more spices are added to the stuffing (mostly salt, pepper and red pepper), and then we can start filling the casing (Pavičić, 2003).

### FILLING THE CASING

For filling the casing with stuffing, a mechanic or an electric machine for grinding meat can be used to which we put a funnel. It appears on the market most often in two models, i.e. 1,25 cm diameter for producing baking sausages and 5 cm diameter for producing other kinds of

sausages. The stuffing is filled by filling machines into well-washed small, large or blind pig guts, except for smoked sausages and salami, which are filled into bovine guts, and headcheese, which is filled in a pig stomach. Before the filling, the funnel of a filling machine is moistened with water. In that way the casing is more easily pulled on, in which process we should be careful that its entire length is equally stretched on the funnel. Casing's end is left to be hanging in the length of around 3 to 5 cm, because in that way it is easier to tie the end of a sausage without the unnecessary extrusion of stuffing from the casing. Before using, casings should be squeezed out well to the ends. A free end of a pulled on casing on an outgoing pipe of a filling machine can be rolled up or tied with a string a few times, so that we can disable a certain quantity of stuffing dripping from the casing at the beginning of the filling. Except for that, a filling machine will equally fill the casing with stuffing, and at the same time we will be taking off the pulled on casing from the outgoing pipe and neatly twisting in the sausage on a pad, without the danger for

▼ **Figure 3.** Filling adequate casings with stuffing

it to be damaged. The filling machine should be equally filled with stuffing, so that a certain quantity of air wouldn't enter the casing, which is visible in the shape of larger or smaller bubbles. If a certain quantity of air still enters the casing with the stuffing, such places are stung with a thin metal needle, which has previously been sterilized by a flame (Kobler, 1999). During the filling we usually shape sausages every 12 or more centimeters, so that in that place we twist in the filled part, and then we continue with filling and twisting in until we use up the prepared stuffing for filling the casings. The place where we twisted in the filled part of a sausage can be tied under and at one's own wish separated to pairs or left in a lineup, which makes the procedure of producing fresh sausages finished. After the filling of blood sausages, *devenica* (*traditional sausage with the addition of blood, flour, bacon and spices*), liver sausages and smoked sausages, 30 cm long ends of sausages are tied under with a string and joined in the shape of a wreath, and after the filling of *kulen* (*a traditional Slavonian dry-cured sausage*) and *kulenova seka* sausages and salami, we tie the ends of casings and then with a few longitudinal and transversal bindings we go over the casings, by which we bind them into a reticule. After that, baking sausages are kept in a refrigerator until being used, blood sausages, *devenica*, liver sausages and headcheese are thermally treated by cooking, and the other sausages, including *kulen*, *kulenova seka* sausage, smoked sausage and salami are hanged on wooden sticks and left for 1-2 days in a clean, airy and cool room to dry and tighten on the surface, after which we put them to smoke-curing (Pavičić, 2003; 2004).

## SMOKE-CURING, DRY-CURING AND RIPENING OF SAUSAGES

Formation of specific characteristics of smoke-cured products is a consequence of smoke settling on the surface and its penetration to products' inside (Živković, 1986). Smoke-curing of sausages is carried out for 5 to 10 or more days in a cold smoke (16 - 25°C), in which process the length of smoke-curing depends on a kind of sausage and its bulk, as well as on the contents of stuffing. The best smoke for smoke-curing of sausages is of dry beech or hornbeam wood, with the addition of their sawdust. Direct and slow burning down of wood is used in the process with the addition of a smaller quantity of sawdust. Dry-smoking is (if not differently described) carried out daily, after which a room should be aired so that sausages don't assume an unpleasant smell. When the sausages assume a nice golden-reddish color, smoke-curing is finished. After the finished smoke-curing, certain kinds of sausages can, with obligatory thermal treatment (cooking or baking), be served or taken to a room for dry-curing

▼ **Figure 4.** Fresh home-made sausages



and ripening. A room for sausage ripening should be dark and airy, with optimum temperature of 12-16°C. Sausages are dry-cured from 40 to 60 or more days, which depends on the kind of sausage and its bulk, as well as on external climatic conditions. After the finished ripening, sausages can be sliced and eaten uncooked (Pavičić, 2003).

In practices today we encounter the usage of fluid smoke in the production of sausages which actually represents a substitute for classic smoke-curing of sausages in smokehouses. It is made synthetically or by fractional distillation of dry wood, in which process a distillate doesn't contain any unwanted carcinogens. Fluid smoke is added in a certain concentration during the preparation of stuffing for sausages. Because of that, the sausage isn't necessary to be smoke-cured in classic procedures, but is immediately placed in a special room for dry-curing, i.e. ripening. But, we should keep in mind that sausages produced by using fluid smoke are inferior in taste and smell to those meat products smoke-cured in a classic manner (Pavičić, 2004).

## HYGIENE IN SAUSAGE PRODUCTION

During the production of sausages in households, we should hold on to certain hygienic standards that affect the quality of a final product. It primarily applies to the cleanliness of working surfaces and equipment used in the sausage production, as well as to the hygiene of people who are the part of that process. We thoroughly clean and wash working surfaces which come to direct contact before the production of sausages. In that way we prevent the possibility of microbial contamination, which can cause rotting of sausages and their harmful effects on human organism. For cleaning the surfaces we use a clean sponge and a prepared working solution of an adequate disinfectant according to the producer's instruc-

tion. A special attention should be paid in the process to corners and uneven surfaces because they are the most suitable for retaining different contaminants. After mechanic cleaning, we rinse out the surfaces with fresh water and wait for them to dry by themselves. People who are the part of the sausage production should put on clean working clothes, wash hands well in a mild disinfectant and wash them out in clean water, before the immediate contact with meat and equipment. It is also recommendable to put disposable gloves (surgical), which can be bought in well-equipped pharmacies. It primarily applies to the people who have injuries (cuts) on their hands, but as well to all the others who want to avoid direct contact of hands with meat and spices during the preparation of stuffing and shaping of sausages for hygienic reasons (e.g. avoiding the meat getting under fingernails). People with disease processes on their hands (mycoses or bacterial inflammations of skin) shouldn't be a part of pig-slaughter and sausage production. The same applies to everyone else who has some other health problems (e.g. digestive), because they represent a potential danger for contamination of sausages with microorganisms, which can cause food poisoning of people (Schmidt, 1996; Kobler, 1999; Pavičić, 2004).

## ZUSAMMENFASSUNG

### ***DIE HERSTELLUNG VON WÜRSTEN IN DEN HAUSHALTEN FÜR DEN EIGENEN BEDARF***

*In der Arbeit sind die Verfahrensweisen der Herstellung von einheimischen Würsten in den Haushalten beschrieben. Die Rezepturen für die Herstellung von Würsten*

*sind verschieden und sie hängen von der Tradition der Gegend, wo sie hergestellt werden, ab. Allerdings muss bei der Herstellung ohne Rücksicht darauf, um welche Sorte der Würste es sich handelt, eine gewisse Normativgrundlage eingehalten werden. Dies alles wegen der Qualität und der Richtigkeit des Endproduktes.*

**Schlüsselwörter:** Würste, Herstellung, Haushalt

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