

TRADITIONAL MEAT PRODUCTS IN FUNCTION OF A MARKET OFFER

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Abstract

Dried cured products are one of the most important groups of traditional forms of food. They are produced in the world during **many** centuries. They have certain **properties** that are related to culture and habits of consumers in different parts of the world.

These meat products, depending on factors, have different texture and different flavor. They make up a significant share of the economic production of local residents, their cultural heritage and are an important part of their national cuisine and gastronomy.

In this paper the authors gave a description of the traditional procedure of making pork products, known under the title "banjalučka pečnica". The amount of salt that was used during the development plays a significant role in establishing the quality and sensory properties of products. The influence of amounts of addition salt (three concentrations), the speed of salt penetration into the meat and the quality and sensory properties of finished **the** product describes in the paper. Product is manufactured according to the traditional process characterized by the specific aroma, taste and odor, and color and texture. The potential for placing the product on the domestic and foreign markets are given at the end of the paper.

Key words: *pig meat products, traditional methods of production, quality, economic importance*

Introduction

Traditional food products have had a major role in the development and preservation of cultural characteristics of different regions for thousands of years. They include foods that have been consumed locally and regionally for an extended time period.

Preparation methods of traditional foods are part of the folklore of a country or a region. Due to changes occurring in the lifestyle of today's population, some of the traditional products are at a risk of disappearing. Therefore, it is very important that these products are researched and documented and saved as part of a national, state or region culture (Weichelbaum et al, 2009).

To define the term "traditional food" is not easy as it could be presumed. The most comprehensive definition of this term is given by European Food Information Resource (EuroFIR), which under the "traditional food includes food products with a specific function that sets it apart from all other similar products in the same category." These differences may originate due to different causes: use of "traditional ingredients" - the raw materials from which primary product is made, "traditional composition" or "traditional methods of preparation and / or production method" (Weichelbaum et al, 2009). This implies that throughout the preparation process of traditional foods, raw or primary products are used, either alone or as ingredients, which are identifiable in a specific geographical region and remain in use today (regardless of the possibility that use of some was abandoned for a time and then reinstated)

Traditional production and / or food processing involves that the process of product making is established prior to the Second World War and passed down through generations by oral or other means, and it has continued to be used, taking into account cases where composition was abandoned for a time and then reinstated. Despite of technological progress and the obligation to comply with modern food-safety regulations, production and/or processing must still be consistent with the methods that were originally used, and obtained food products must preserve the intrinsic features (physical, chemical, and microbiological). The European Union traditional products associate with geographical origin or with the traditional methods of production.

The definition of traditional food products may not necessarily reflect opinions of consumers. According to research conducted by Vanhonacker et al. (2008) European consumers under traditional products include well-known food, food they have eaten already or their ancestors did. When comparing opinions in several countries of the European Union on this matter of traditional food products, the least cross-country differences were found for statements related to the common character of the product and its long existence, while the highest discrepancies were found for specific sensory properties.

The term "dry meat product" is used to refer to a large number of meat products. The basic meaning of the term may vary depending on product and country of origin. The term "cured products" is used when one wants to emphasize that during the production of a product curing mixture has been used (which is mostly composed of sodium chloride, sodium nitrite and nitrate and other ingredients) in order to create typical color and flavor in a product. If during this process, only salt is used, process is called salting. The process of salting / curing essentially can be implemented in two ways: in the dry salting / curing, surface is rubbed with a piece of meat with salt or curing mixture and wet salting / curing, when pieces of meat are immersed in salt solution or curing mixture or are injected into meat pieces.

In traditional preparation of meat products dry curing process is commonly used. After curing, the meat is smoked and dried. In the past, methods of drying food were necessarily applied in areas with mild climates, such as the Mediterranean area (Toldra, 2002). In the opinion of the mentioned author, the production and consumption of dry cured meat products originates from southern Europe, because specific climate allows natural drying and maturing of products. There is numerous historical evidence about dry curing meat practices use in ancient Egypt, Greece and Rome (Toldra, 2002). It is thought that modern method for production of dry cured fermented sausages, originates in 1730 in Italy and 1780 in Germany (Leistner, 1992). Climatic conditions have a significant influence on the production process. Particularly significant are humidity, altitude and temperature changes, windiness, etc.

From dry cured pig meat in the longest use are dried ham and meat in pieces, shoulder blade meat, aitchbone and meat of leg muscles "*M.longissimus dorsi*". Harnidez et al. (1999) have had outlined a process for the production of traditional cured pork products in pieces in Spain and Italy. The essence of this procedure is the following: the surface of the whole muscle piece is rubbed with moist mixture consisting mainly of salt, nitrite, nitrate, sugar and spices, pepper, garlic. After that, the meat should remain in pickling mixture for at least a week, depending on the outside temperature. During this period the mixture ingredients and spices should diffuse into the pieces of meat. When salting stage is completed meat surface is washed, the excess salt is removed, and pieces of meat are hung on rods and leaved to hang in drying chambers up to a month. During this period it is necessary to reach equilibrium salt concentration in all sections of the meat pieces. The temperature in the drying chamber is about 8°C and relative humidity of 72-82%. Afterwards, the meat dries for 15 to 20 days at 20-22°C, water content is reduced to the required value, and specific flavor is formed (Harnidez et al., 1999). At the end of the process, the pieces of meat lost 35-45% of its original mass.

Production of dried meat products from pork in pieces has a long tradition in Bosnia and Herzegovina. Specialties of this product group, because of its remarkable and specific sensory properties, are highly valued on a market (Antonić et al., 2006a, b).

One of the most famous products of dry cured meat is pork ham. It is made from the best body sections of the meaty pig breed and in detail processed and specifically molded pig musculature. After forming, the pieces of meat are dry salted or pickle, and dried dime. Depending on the applied forming and processing during the procedure, products are obtained that have specific properties which are associated with the region in which a product is developed (Uzice ham, Romanija ham etc) (Vukovic, 1998; Radovanovic et al., 1990). Final product has the characteristic properties, quality and purpose. Significant impact unto quality of the finished product has phases of salting/pickling, smoking, drying and fermentation. Specific flavor and texture of the products are formed during the production process. During this period, due to the large number of biochemical reactions, a change within the structure of muscle tissue occurs. Biochemical changes are taking place under the influence of endogenous proteolytic and lipolytic enzymes from meat (Toldra, 1998) and presence of a positive microflora. The quality of the finished products is significantly impacted by micro conditions in a particular region (Radovanovic et al., 1990; Antonic, 2006, a, b, c; Brenjo, 2011).

Having in mind a quality of the meat, duration of the process, work and the quality properties of the final product, acceptance and demand for dry meat products by consumers and high price they reach on the market can be explained. Obtained specific properties of products depend upon numerous factors, but primarily on the quality of materials and workmanship. Regardless of the effort invested, products which quality is not uniform and often deviates from the typical primarily sensory properties, can be find on a market. Given the above, we have chosen to determine in our work the parameters that most intensely affect the traditional process of making dry meat products from pork meat "banjalučka pršuta" and formation of product properties. In addition, we want to point out two directions in the production of this product: product manufacture according to the traditional procedure in strict compliance with all stages during the production and production of new products in industrial conditions based on the traditional procedure, but with the possibility for applying certain innovations to accelerate some of the phases in the production process.

Materials and methods

For examination in this study, 18 bodies' samples of meaty breed pigs were used the average weight of 102.0 kg. Slaughter of pigs and primary processing of a body were prepared in the usual way. Cooling of a body was carried out for 20 hours at $2 \pm 2^\circ \text{C}$, or until reaching $5 \pm 2^\circ \text{C}$ in the depth of leg. Cutting of chilled pork into basic sections is done in a way that is characteristic for the local food industry. Special attention was given to formatting and processing of *M. Longissimus thoracis et lumborum*, which is used during the preparation of hams. Process involves muscle separation from fat and connective tissues from the surface, as well as the formation of meat pieces into the final form ready for further production of pork ham.

Samples of handled and formatted muscles are salted by rubbing a certain amount of salt (4.0% compared to muscle mass), without the addition of nitrite. Salting process lasted for 8 days at $2 \pm 2^\circ \text{C}$, after which the samples were squeezed and salt stripped of for 2 days at the same temperature. During the next 20 days, phases of smoking, drying and maturation were carried out. The total duration of the process was 30 days.

For the first 10 days of salting, measuring of weight and length was done daily and then every fourth day (from the caudal edge of the loins to the cranial edge of the back) and

volume (three positions; around 5 cm from each end - A and C and in the middle of the longitudinal muscle axis - B) in all 18 samples of *M. Longissimus thoracis et lumborum* (Fig. 1).

For the first 10 days of salting, content of salt was studied daily and then every fourth day. Salt content was studied in two coaxial layers of muscles A and B (Fig. 2). Sampling was done by forming steaks of meat thick about 1 cm (transverse to the longitudinal axis of the cut muscle. For layer A part of the muscle was taken 1 cm away from the edge of the steak, and the B layer was taken at central part of the steak. Contents of salt, according to the above schedule with two repetitions, were determined using the standard method (ISO 1941-1, 1999). Sensory Analysis of final products of pork ham ("banjalučka pršuta") was performed by a group of 20 trained evaluators by scoring method (ISO 8587, 1988) in a specialized laboratory for sensoric analysis.

Results and discussion

The results obtained in this study are presented in three tables. Comparing these results with the results of other authors, it can be concluded that the process of making pork ham in Banja Luka area is very similar to the procedures used in other parts of the Balkans and the Mediterranean. Basic difference is in a recipe of a product, related to nitrite and nitrate, which are not used in the region of Banja Luka during the preparation of pork ham according to the traditional procedure. The length of each phase, primarily salting, depend on external factors (temperature and humidity).

Considering that the analyzed product is very appreciated by consumers, it is recommended to make it according to traditional process and simultaneous production of this product in industrial conditions by a modified procedure, while preserving majority of production parameters in traditional conditions. In order that this and other meat products preserve completely authentic qualities, it is necessary that during its preparation, besides using a traditional procedure, meat of indigenous varieties of pigs is used. Unfortunately, indigenous varieties of pigs are "lost", and dry meat products can only be made by traditional technology, without marks of authenticity.

Simultaneously, with the globalization of the world food market, consumer's interest in food quality is growing. This consumer interest refers not only to healthier and safer products, but also to the origin and production methods. Consumers increasingly require better quality food products associated with the notion of traditional, because it is "nostalgia" that brings them back to the roots (Gellynck and Viaene, 2002). Traditional food products, which are associated with specific geographic regions and specific gastronomic heritage, have a chance to take a significant role on the market, as more and more consumers are seeking the return to a tradition. These changes provide the opportunity for small businesses to secure market for their products, by changing their strategies (Gellynck et al., 2012).

The authors share the opinion that the production of dry meat products and offer on the market, both locally and for export is possible, that effort should be implemented on renewal of local breeds of pigs and to carry out education for rural population how to apply traditional methods of production in new conditions, especially how to comply with new requirements concerning hygiene and food safety.

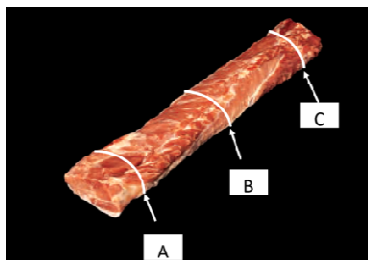


Figure 1. Sampling of samples from investigation of **ham** weigh, lenth and circuit durig production pork's

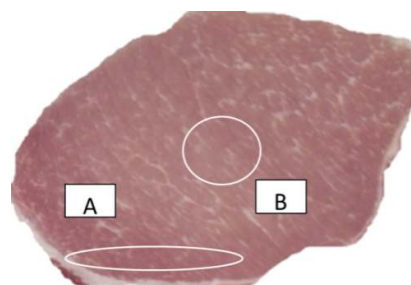


Figure 2. Sampling of samples from investigation of content of NaCl durig production pork's prosciutto

Table 1. Change of weight, lenth and circuit of samples *M.longissimus dorsi* during production pork's ham

	Weight (g)	Lenth (cm)	Circuit (%)
Initial	2596	58,67	27,58
End salting	2669	58,83	27,67
End post-salting	2714	59,17	25,08
Mid drying	2342	59,75	22,58
End drying	1702	59,25	19,92

Table 2. Change of sodium hloride concent in samples *M.longissimus dorsi* during production pork ham

Fase of production	Layer A	Layer B
Initial	2,12	1,13
End salting	3,38	3,45
End post-salting	2,28	2,37
Mid drying	2,85	2,76
End drying	4,32	4,36

Table 3. Results of sensory analysis of pork's ham

	Q	Calculated indicators
Appearance	3	14,40
Composition and appearance of cross section	3	14,03
Colour and its stability	3	13,73
Smell and taste	7	31,33
Texture	4	18,70
% of maximum possible quality		92,28
Pondered mean value		4,61

Conclusion

Based on results presented and defined conditions of production shown in this paper, the following conclusions can be made:

- The average weight loss during the manufacturing process of pork ham is about 34%. The average increase in length of the test musculature is about 1.2%, the average reduction in the volume of the test musculature during the preparation ham is least pronounced at the ends (position A-18.43% and position C 21.38 %), while the least pronounced reduction is in the central position,
- At all times of production an average salt content properly increased in both observed layers (surface A and central B). The most intense increase of salt concentration in both layers was measured during the first four days. After the entire production

- process, an average increase of salt content in the surface layer ranges between 50% and 60%, and in the central part of 72-76%,
- Salt content in the finished product is balanced and satisfying. All samples of pork ham in sensory evaluation are high ranked with an average pondered mean value of 4.61.

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