

Quality of Traditional Specialities Guaranteed in Visegrad Group



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Project description

The V4 countries have a lot of traditional foods and food products. In all of these countries, such products are important because they represent the nationality and originality of individual countries. Some of these foods and food products have been included in EU legislation as traditional specialities guaranteed. This label should guarantee that any product in this category has the same quality as traditional production. The question is, whether the quality of traditional specialities guaranteed (TSG) is really observed. In the research carried out previously by project applicants it was found out that the quality is not observed in all cases and the differences were found between individual countries. The aim of project is to find a suitable way of TSG quality control applicable across all V4. 1st step: Preparing brief information about national traditional products with or without the (TSG) label in V4. The TSGs of interest are meat and dairy products. In all V4 countries, the range of TSG products will be checked. During the 1st step, selected information will be collected: how many of meat and dairy national traditional products with or without the TSG label are on the market, which TSGs are in majority, how many of traditional specialities are without TSG labelling but with the same or very similar product name. 2nd step: Selection of the most important national traditional products to be evaluated, subsequently selection of criteria for the quality control. Criteria will be chosen so that every participant of the project would be able to investigate one part of them. 3rd step: organization of the networking meeting, during which the methods for the determination of the TSG quality will be discussed. Meeting will include a workshop aimed at selected analytical methods that will be used for the national traditional products quality evaluation. These steps will ensure the comparability of the results from all laboratories between each other. 4th step: Examination of the TSGs according to the selected criteria and discussion about the results among partners. 5th step: Presentation of the results at the conference and partners university. Information transfer will be targeted to partner organizations and to inspection bodies that are responsible for the quality evaluation of national traditional food products with or without the TSG label in V4. The results of the project will be presented in oral form during the conference and as a plenary lecture in university education in written form in conference proceedings book and will be published on the new web pages created as a part of the project.

1. Traditional Specialities Guaranteed in Czech Republic

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1.1. Description of Czech traditional products

Major traditional specialities guaranteed sold in the Czech Republic include mainly the following products: Špekáčky, Lovecký salám, Spišské párky, and Liptovská saláma. In 2016, Český svaz zpracovatelů masa applied to register another meat product, namely Pražská šunka. The application is now published and the product may be registered after the settlement of any objections. Traditional meat products manufactured in the Czech Republic also include long-keeping cured sausage named Dunajská klobása. Individual products will be further described, except for Spišské párky and Liptovská saláma, which are contained among TSGs of the Slovak Republic. The reason is that all these products have a production tradition in both, the Czech Republic as well as Slovakia. However, Spišské párky and Liptovská saláma have a primary geographic relation to the Slovak Republic.

‘Špekáčky’

‘Špekáčky’ or ‘Špekačky’ was applied by Český svaz zpracovatelů masa and by Slovenský zväz spracovateľov mäsa. The name ‘Špekáčky’ expresses the specific character of the agricultural product or foodstuff, which derives from the unevenly distributed pieces of bacon (špek) in a coarse mixture with a smallish proportion of collagen particles. The basic character of the products is smoked and heat-processed meat sausage made from a continuous strand several metres long stuffed into casing made of pork small intestine or beef rounds, and are golden-brown in colour. The size of each piece is 4.0 to 4.6 cm in diameter and 8 to 9 cm in length. They weigh around 65 to 85 g (EC No.: SK-TSG-0007-0055-21.05.2007).

In terms of their consumption, ingredients and production processes, ‘Špekáčky’ have been known in what is now the Czech Republic for over 100 years. They began to be produced on a large scale in the second half of the 19th century, with the development of smoked meat industry, and came to be regarded as a high-quality meat product in beef round casing. In 1891, they were exhibited (EC No: SK-TSG-0007-0055-21.05.2007).

The quality of meat products was not, at that time, subject to any rules and regulations. Public inspections focused mainly on flour, which was not allowed to be added to ‘Špekáčky’. After World War II, the key ingredient in ‘Špekáčky’, besides bacon, was still beef. Later, as pig farming increased, the composition of ingredients was: 40 % beef (front cuts), 30 % production quality pork and 30 % bacon. At that time, the seasoning was changed with the addition of sweet paprika. After meat-producing and meat-processing businesses were nationalised, the composition of the ingredients, additives, casings and technological processes became subject to technical and economic standards, which continued to improve the quality of this traditional Czech product. Production of ‘Špekáčky’ was covered by the technical and economic standards for meat products (Part 1 of the rules applicable from 1 January 1977, meat industry directorate-general, Prague) under No. ČSN 57 7115. As a result, their manufacture according to those standards spread throughout the former Czechoslovakia. As the production technology gradually changed, and owing to the limited availability of certain ingredients or casings (for example beef rounds), a set recipe was created, which is given above in the description of ‘Špekáčky’ production methods (EC No.: SK-TSG-0007-0055-21.05.2007).

The ingredients of 'Špekáčky' are as follows: 38.5 % of beef with fat content of up to 30 %; 17.5 % of pork meat with fat content of up to 50 %, 27.0 % of bacon, drinking water (in the form of scaly ice), potato starch, nitrate salting mix, ground black pepper, sweet paprika (100 ASTA), garlic (in the form of flakes, concentrate or powder in amounts corresponding to the standard amount of fresh garlic), ground nutmeg, polyphosphates E450 and E451 (3 g/kg as P₂O₅), ascorbic acid E300 (0,5 g/kg), casing of beef rounds or pork small intestine; tied with string (EC No.: SK-TSG-0007-0055-21.05.2007). The exact recipe for 100 kg of 'Špekáčky' as a finished product is published at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:094:0018:0022:EN:PDF>. Besides ingredients, chemical and organoleptic properties are also defined. In terms of chemical properties, the following is determined: Net muscle protein content: min 6 %; Fat content: max 45 %; Salt content: max 2.5 % of weight.

The ingredients (apart from the bacon), additives and seasoning are used to produce a mixture with particles of between 0,1 mm and 2,5 mm. Bacon, chopped into pieces up to approximately 8 mm, is then added to the mixture, which is stuffed into beef rounds or pork small intestine casing with a maximum diameter of 4,0 to 4,6 cm. The mixture is then divided off into individual segments with string. The strands of the product are tied to a smoking stick, then taken to a smokehouse, where they are dried and smoked in order to achieve their distinctive colour and smell. The smoked product is then heat-processed at 75 to 78 °C until the middle of the product reaches 70 °C for at least 10 minutes. After heat-processing, the product is sprayed with cold water and left to cool. The 'Špekáčky' are then stored in a cool, dark room. External appearance and colour – the product is made from a mixture of beef and pork meat in natural intestine casing divided off with string. The product is golden-brown in colour – a darker or lighter shade is permitted, without any marked smoke-mottling. On the surface of the product dried drops of juice and lighter areas at the contact points of the individual pieces are permitted. The surface is smooth or slightly wrinkled. Bulking out the product with fat or aspic is not permitted; appearance and colour in section – the slice section is pale to dark red, with unevenly distributed pieces of bacon. Small, soft collagen particles and air cavities are permitted; taste and aroma – mild when freshly smoked, moderately salty from the seasoning; juicy when cooked; consistency – firm, tender, compact. (EC No: SK-TSG-0007-0055-21.05.2007).

Currently, 'Špekáčky' are TSG registered without name reservation. Thus, one can also buy 'Špekáčky' which are not in compliance with the EC No.: SK-TSG-0007-0055-21.05.2007. Nevertheless, composition of such 'Špekáčky' is also defined. Basic ingredients for production and sensory requirements are set out in a national Decree (Decree No. 69/2016). Raw material can include beef, pork, or veal; however mechanically separated meat or mechanically separated poultry meat are not permitted. Organoleptic requirements are worded as follows: consistency – elastic, fragile and compact; appearance and colour in cross-section – a cut chilled product should be light to dark pink, bacon cubes located irregularly, permissible are tiny soft grains of collagen particles, air cavities to a small extent and slightly rendered fat; taste and smell – pleasant smell of fresh sausage and spice, appropriately salty and spicy, a cooked product must be juicy when bitten (Decree No. 69/2016).

Various quality of these products, however, is confusing for consumers, as a result of which an amendment to the regulation for 'Špekáčky' was applied (Official Journal C167 11.05.2016). In case of successful application, the products will be protected with reservation of name and the name will be changed to 'Tradiční Špekáčky'/'Tradičné Špekačky'. This means that all products named as 'Tradiční Špekáčky' will be manufactured in compliance with EC No.: SK-TSG-0007-0055-21.05.2007.

'Lovecký salám'

'Lovecký salám' or Lovecká saláma was applied by Český svaz zpracovatelů masa and by Slovenský zväz spracovateľov mäsa. The name 'Lovecký salám' is specific in itself because it is well known in the Czech Republic and in Slovakia and has a long traditional association with a specific long-keeping fermented meat product having a characteristic flat rectangular block shape and a characteristic taste. The size of each piece is 50-55 cm in diameter and around 40 cm in length. The product is sold in

characteristic shape of a flat rectangular block with a gut casing (EC No.: SK-TSG-0007-0044 — 4.8.2006).

The origin of the product 'Lovecký salám' in the Czech Republic can be traced back to the beginning of the 20th century. At that time it was made mainly in winter because of the more favourable conditions for the maturing process and in view of the difficulty associated with treating raw materials by means of moderate freezing, a precondition for their successful granulation. Later, with improved cooling methods and smokehouse machinery, production was concentrated mainly on supplies for the Easter and Christmas markets and the summer tourist season. Today it is a traditional and popular long-keeping product made all year round. The product 'Lovecký salám' was featured in the publication *Technológia mäsového priemyslu (Meat Industry Technology)* (Part II, 1955, Hlavná správa mäsového a rybného priemyslu (Meat and Fish Industry Main Report), Ministry of the Food Industry) and was subsequently included in the Technical and Economic Standards for Meat Products (Part 1, rules applicable as from 1 January 1977, Food Industry Directorate-General, Prague) as Czechoslovak national standard No. ČSN 57 7269, which resulted in the expansion of production according to this standard throughout the former Czechoslovakia. A stable recipe developed from gradual changes in manufacturing techniques that came about in response to the limited availability of some ingredients and the objective of improving the safety of the end-product EC No.: SK-TSG-0007-0044 — 4.8.2006).

'Lovecký salám' is produced from 5 % of beef with up to 10 % fat content; 75 % of pig meat with up to 20 % fat content; 10 % of pork offcuts with up to 30 % fat content; 50 % of pork offcuts with up to 50 % fat content; 50 % of pig fat, nitrite salting mix, antioxidant (E 315 or E 316 (max. 500 mg/kg expressed as erythorbic acid)), ground black pepper, sugar, garlic (in the form of flakes, concentrate or powder in an amount corresponding to a standardised quantity of fresh garlic), ground cloves, starter cultures (a combined culture containing lactic acid bacterial strains (*Lactobacillus* and/or *Pediococcus* genus) and coagulase-negative *Micrococcaceae*) and collagen casings EC No.: SK-TSG-0007-0044 — 4.8.2006).

The pork offcuts with up to 50 % fat content and the pig fat are frozen. All the raw materials and ingredients and the spices are combined to prepare a mixture with grain size of 3-5 mm, which is fed into casings 50-55 mm in diameter and approximately 40 cm long. The product is then formed into a flat rectangular block shape. The shaped products are laid close together in clean boxes or other suitable containers and left to mature in a refrigerating chamber at a temperature of 2-4 °C for 24-48 hours. The products are then hung on smoking rods and smoked in cold smoke for approximately seven days at a temperature of up to approximately 24 °C. Once the smoking process is complete, the products are dried. The product must not be attacked by mould during the drying process. When the prescribed water activity value is achieved, the product may be dispatched. The drying time is approximately 14 days in order to ensure that the product undergoes sufficient fermentation at temperatures and a relative air humidity enabling the starter cultures to grow and the product to dry evenly (temperature range: 16-27 °C; relative air humidity range: 75 % to 92 %). External appearance and colour – product made from a mixture of beef and pig meat; dark brown in colour, moderately wrinkled surface, visible granulation beneath casing; appearance and colour of cut surface – mosaic of grains of up to 5 mm for the most part, without clusters of fat and lean particles; tiny air cavities permitted; the lean particles are a meaty red colour towards the middle of the product and darker towards the edges; fat grains are of a light colour. The cut surface of the product has a rectangular shape; aroma and taste – distinct aroma from the smoking process; very spicy and salty taste; consistency – fairly solid; elastic. (EC No.: SK-TSG-0007-0044 — 4.8.2006).

'Lovecký salám' is also registered without name reservation, thus one can also come across products that are not in compliance with (EC No.: SK-TSG-0007-0044 — 4 August 2006). These products, however, are also subject to legislative restrictions set out in the national decree (Decree No. 69/2016). Basic ingredients for 'Lovecký salám' include beef and pork. Use of certain food additives, such as fibre and vegetable protein, is limited as well. Use of meat and proteins of other

animal species is not allowed. Likewise, use of mechanically separated meat, including mechanically separated poultry meat, is prohibited. Organoleptic characteristics are defined as follows: consistency – rather tough, elastic; appearance and colour in cross-section – a mosaic of grains predominantly in size under 5 mm, without clusters of fat and lean particles, permissible are tiny air cavities; colour of lean grains towards the middle of the product rather deep pink, towards the edges darker; fat grains light; smell and taste – pleasant, smoking-marked, typical for this product, rather sharply spicy and salty; pleasantly sour taste.

Similarly to 'Špekáčky', change to the reservation with name including the name change to the 'Tradiční lovecký salám'/'Tradiční lovecká saláma', was applied (Official Journal C167 11.05.2016).

'Pražská šunka'

'Pražská šunka'/Prague ham is a meat product for which an application for registration to the TSGs group was filed already in 2010. Due to the objections proceedings, the application was modified and resubmitted in 2016. The application is conceived as an application with name reservation, which means that in case it is registered, all the products with this name will be manufactured of the defined raw materials and in compliance with the registered production technology that originates from traditional Czech ham production. The uniqueness of this product is that it is produced in several variants. Namely, they are the 'Pražská šunka' on the bone, boneless, and tinned. All of these categories are also described in the application for TSG registration (EU No: CZ-TSG-0007-0061-21.10.2010).

The name 'Pražská šunka' has been used since the 1860s to denote one of the best-known food products originating in the Czech Republic, in particular in Prague. Historical sources show a product called 'Pražská šunka' to be connected with the name of František Zvěřina, who first produced it. Josef Jeřábek, a well-known Prague smoked meat producer, took over the production of 'Pražská šunka' from František Zvěřina. Other makers of this product included the Prague smoked-meat producers Dlouhý, Malý, Cibulka and others. The production of 'Pražská šunka' also began in other large towns and cities, following the example of Prague. In Brno, it was made by the smoked-meat producer Jebavý, in Hradec Králové by the smoked-meat producer Hutla, and in Pardubice by the smoked-meat producer Sochor, and it was being made by many other smoked-meat producers by the end of the 19th century. Figuratively speaking, the 'Pražská šunka' made by Zvěřina was the ancestor of all the others. Industrial-scale production of 'Pražská šunka' was started by Antonín Chmel, who established his firm at U Zvonařky in Prague in 1879. Besides 'Pražská šunka', his flagship product, he also produced a wide range of smoked-meat products which quickly gained a reputation in Prague and other towns, especially spa towns, and eventually in a number of European countries. However, his most commercially successful product was 'Pražská šunka' which soon even found its way onto markets overseas. After the Second World War, the firm was nationalised and a number of other production plants in Prague were gradually amalgamated with it. It was during this period that other variants of 'Pražská šunka' came into being in the form of semi-preserved or tinned ham made from pork-leg muscle meat. In 1977, the U Zvonařky plant and all of its employees and resources were absorbed into the newly built meat-industry combine Masokombinát Praha jih – Písnice. The advent of new curing technologies saw the introduction of brine-spraying, with or without subsequent massaging, in the production of 'Pražská šunka'. During the post-1989 privatisation period, the meat-industry plant at Písnice closed down, but the production of 'Pražská šunka' on the bone continued at a number of other production facilities across the Czech Republic. The basis for the production of 'Pražská šunka' originally lay in the selection of the raw materials and the method of curing. The raw materials used were pork legs from lightweight pigs, which is also why the current recipe specifies a maximum weight of 10 kg. Another distinguishing feature of the production process, which has been passed down from one generation to the next, is that the pork leg is given the 'Prague cut'. Chilled pork legs were cured by rubbing the surface of the meat, in particular the skin, thoroughly with a nitrate curing mix containing a small amount of sugar. The bottom of the curing pot was lightly salted and the pork legs were placed skins down. Boiled and refrigerated nitrate brine, again containing a small amount of

sugar, would be poured over the hams, which would then be weighted down. The hams were subsequently turned so that their underside was on top and their topside underneath. The hams were again weighted down. After sensory quality control, the hams would be soaked for several hours in lukewarm water and then left to dry. This was followed by the final process, namely the removal of the pelvic bone, the scraping of the surface of the skin and the binding of the shank so that its shape would not be damaged by cooking. The hams were always hung in a heated smokehouse. Smoking comprised two stages: firstly drying over a brightly burning fire, and secondly flavouring and colouring with the aid of moistened hardwood sawdust. The hams were usually smoked slowly for 8-12 hours. The hams would then be scalded in boiling water and cooked. They would then be cooled by soaking them in cold water (EU No.: CZ-TSG-0007-0061-21.10.2010).

‘Pražská šunka’ on the bone is produced from 100% of whole pork legs cut in the Prague style with brine in total 20 % contained water, nitrite or nitrate pickling curing mix, sugar, stabilisers, spice extract or oil, antioxidants. The fatty part is rounded from the loin end. Cut in the Prague style means that the flank and sacrum, including tail and pelvic bone, are removed from the whole bone-in leg which includes the knuckle but not the trotter (EU No.: CZ-TSG-0007-0061-21.10.2010).

The pork legs are sprayed with brine of the prescribed composition. They are then left to rest in brine or may be massaged with brine. This is followed by cooking, which has the effect of pasteurisation. After being cooked, the products are dried in a smoking chamber and surface-smoked to achieve the characteristic taste, aroma and colour, and then cooled and stored. Alternatively, if the pork legs are not salted by being injected with brine and then left to rest or massaged, chilled legs may be salted and worked by rubbing their surface thoroughly with a nitrate curing mix containing a small amount of sugar. They are then placed, skins down, into lightly salted curing pots. Boiled and cooled nitrate brine, again containing a small amount of sugar, is then poured over them. The hams are weighted down so that they are completely submerged in the brine and after an appropriate period of time, in the light of the results of continuous sensory quality checks, are turned over so that their underside is on top in the curing pot, and their topside is underneath. After being thoroughly salted, the hams are soaked for several hours in lukewarm water and then left to drip dry. The hams are first dried in a smoking chamber and then surface-smoked to achieve the characteristic taste, aroma and colour. This is followed by cooking, which has the effect of pasteurisation, and then cooling and storage. Whichever of the two alternative methods is used, the final production stage may also be completed by baking the surface and treating the skin using various decorative techniques (EU No.: CZ-TSG-0007-0061-21.10.2010).

Boneless ‘Pražská šunka’ was developed as an alternative to the original in the period before the Second World War. These took the form, firstly, of pasteurised boneless ‘Pražská šunka’ produced from pork-leg muscle meat. It was produced by Antonín Chmel at U Zvonařky in Prague and by Josef Beránek at Beránkové podniky, his firm’s plant. The technology used to produce these types of ‘Pražská šunka’ consisted in boning refrigerated fresh pork legs, processing individual parts of them, sorting them according to their colour and mechanically and intermittently breaking up the raw materials whilst adding sodium chloride and the necessary amount of sodium nitrite and sugar, all partially dissolved in a specific quantity of brine. This was followed by pasteurisation and refrigeration. After the Second World War, the production of pasteurised ‘Pražská šunka’ was mainly concentrated at meat-industry plants at Brno, Kostelec, Studená, Vamberk and Planá nad Lužnicí. The late 1970s saw an increase in production in these plants of boneless ‘Pražská šunka’ using moulds and the subsequent packaging of the end product in plastic containers, which on the one hand eliminated the use of cans but in particular meant that, after pasteurisation, the product could be smoked and made it possible to add a thin decorative layer of pork fat or pork fat and skin. The product and its parameters have therefore been brought significantly closer to the original ‘Pražská šunka’ on the bone. Since 1989, boneless ‘Pražská šunka’ has been produced at other sites across the entire Czech Republic (EU No.: CZ-TSG-0007-0061-21.10.2010).

The boneless pork legs or sides of pork leg are sprayed with brine of the prescribed composition and/or may be massaged with brine. Salted slices of pork fat, with or without skin, are massaged separately if used to make a decorative surface coating for the product. After the raw materials have been salted and massaged, they are placed in oval or egg-shaped moulds in such a way that the fat, with or without skin, always provides the product with a decorative surface coating. If slices of pork fat, with or without skin, are used to create a decorative surface coating for the product, the moulds are lined with massaged slices of fat and only then filled with trimmed sides of pork leg. This is followed by cooking in the moulds, which has the effect of pasteurisation. After cooking, the products are removed from the moulds, smoked to achieve the characteristic taste, aroma and colour, and then cooled and packaged. It is also possible to complete the final production stage by baking the surface and treating the skin using various decorative techniques. Organoleptic characteristics are external appearance and colour – the side covered with skin is golden yellow. Other parts of the surface are not covered with skin and have a lighter covering of fat, ranging from yellowish to golden in colour, with the ham muscle meat being golden-brown to dark brown; appearance and colour in cross-section – the muscle meat is meaty pink when sliced; taste and smell – a distinctive taste and smell of cooked and smoked ham, appropriately salty taste; Consistency – firm and compact. The product is tender to the bite when thinly sliced. (EU No.: CZ-TSG-0007-0061-21.10.2010).

Boneless Prague ham is produced from boneless pork leg or sides of pork leg which are smoked after being cooked. Another distinctive characteristic is the presence of a decorative surface coating, consisting of a thin layer of pork fat or fat and skin. The finished product's typical egg-like or oval shape is another distinguishing feature. The boneless pork legs or sides of pork leg are sprayed with brine of the prescribed composition and/or may be massaged with brine. Salted slices of pork fat, with or without skin, are massaged separately if used to make a decorative surface coating for the product. After the raw materials have been salted and massaged, they are placed in oval or egg-shaped moulds in such a way that the fat, with or without skin, always provides the product with a decorative surface coating. If slices of pork fat, with or without skin, are used to create a decorative surface coating for the product, the moulds are lined with massaged slices of fat and only then filled with trimmed sides of pork leg. This is followed by cooking in the moulds, which has the effect of pasteurisation. After cooking, the products are removed from the moulds, smoked to achieve the characteristic taste, aroma and colour, and then cooled and packaged. It is also possible to complete the final production stage by baking the surface and treating the skin using various decorative techniques. Products produced using whole boneless pork legs with fat cover with or without skin, and where appropriate trimmed sides of pork leg with fat cover with or without skin, may before cooking be formed into the prescribed shape with the aid of film which is removed from the product post-cooking. In such cases, it is not necessary to use moulds. Organoleptic characteristics are external appearance and colour - the side covered with fat and skin is golden yellow. If the surface is covered only with fat, without skin, the surface is in lighter shades from yellowish to gold; appearance and colour in cross-section, taste and smell, consistency is similar to Prague ham on the bone. (EU No.: CZ-TSG-0007-0061-21.10.2010).

Tinned 'Pražská šunka' is another variant of the original which came into being after the end of the Second World War. It was also produced using sorted raw materials from the boning of chilled fresh pork legs, with the addition of nitrite curing mix, sugar and gelatine; in order to achieve a longer shelf life, it was sterilised in egg-shaped packaging at a weight of 1 lb. The commercial success of the tinned ham was due to a very large extent to the proportion of aspic in the finished product. Tinned 'Pražská šunka' has been produced since 1973, mainly by meat industry plants in Kostelec, Krahulčí and Studená. Since 1989, this variant has also been produced at other sites across the entire Czech Republic (EU No.: CZ-TSG-0007-0061-21.10.2010).

For tinned Prague ham are used 100 % of trimmed sides of pork leg (either whole or coarsely chopped), 4 % of gelatine (powdered) and brine prepared from the water, nitrite curing mix and sugars. The packaging is flat, oval made from materials suitable for sterilisation and ensuring the weight of the content of the completed product (approx. 0,454 kg), is used. The sides of pork leg, whole or coarsely

ground, are massaged with brine. After the muscle meat has been brined in this way, it is placed into vacuum-packaging on the bottom of which is an appropriate quantity of powdered gelatine. After the packaging has been vacuum-sealed, the product is left to rest at a temperature of 5 °C for 12 hours. This is followed by sterilisation, during which a minimum heat effect corresponding to a temperature of 121 °C for 10 minutes must be achieved in all parts of the product. After cooking, the product is cooled and stored dry at a temperature of 0-25 °C and a relative humidity of up to 85 %. It has a shelf-life of at least three years. Organoleptic characteristics are smooth golden-yellow layer of aspic between the packaging material and the product; appearance and colour in cross-section – the ham is of a meaty-pink colour. Small, isolated holes filled with aspic are permitted; taste and smell – distinctive taste and smell of cooked ham, appropriately salty taste; consistency – firm and compact. (EU No.: CZ-TSG-0007-0061-21.10.2010).

‘Dunajská klobása’

Another traditional product is a long-keeping fermented sausage sold under the name ‘Dunajská klobása’. Composition of this product is defined in Czechoslovak technical standards of ON 577265. No application to have ‘Dunajská klobása’ registered among the TSGs has been submitted yet. ‘Dunajská klobása’ is produced by fermentation and is smoked by cold smoke. Paprika is predominant in its taste. A combination of sweet and hot paprika is used. Other spices used include black pepper, garlic and cumin. The product mosaic is irregular with fat particles. The product is brown at the cross-section. It is mainly stuffed into sausage casings. The taste is distinctive for smoking and spice. ‘Dunajská klobása’ is a speciality which is primarily consumed at festive gatherings. ‘Dunajská klobása’ was invented as a replacement of Hungarian csabai sausages. Nevertheless, it is also widely used in the Czech Republic. With regard to its popularity, it is also listed among the products mentioned in the Decree (Decree No. 69/2016). The basic ingredients for ‘Dunajská klobása’ are beef and pork. Using fibre, meat of other animal species, mechanically separated meat, mechanically separated poultry meat, proteins of other animal species or plant proteins is not allowed.

Under the Decree, organoleptic characteristics of the ‘Dunajská klobása’ are as follows: consistency – rather tough, compact; appearance in cross-section – pink-red, grains mostly up to 6 mm, without a ring under the casing; smell and taste – pleasant, aromatic, distinct spicy paprika-marked, average up to considerably salty, fragile and soft to the bite (Decree No. 69/2016).

Production of ‘Dunajská klobása’ lies in processing basic raw materials which are high quality pork and beef. Before processing, the raw material must be frozen at a temperature of -5°C (48 hours) or -10°C (24 hours). Before using, they are thawed at least to a temperature of -3°C beef of higher quality of bodies for meat processing is cut up in a cutting machine into 3 mm grain size and kneaded with other ingredients. Pork meat is added, briefly stirred and the mass is then turned over in the cutting machine with a simple composition terminated with a plate with holes of 6 mm in diameter. The mass can also be prepared in a cutter. The mass needs two or three days to ferment in a cold store, then be stuffed into pig’s small intestines thus creating the sausages with a length of 20-25 cm. These sausages are smoked for two days in cold smoke, then moved to air-conditioned drying and ripening chambers where the temperature and relative humidity is regulated. During this drying proces, which takes approximately 14-16 days, the products are still smoked by cold smoke (Kubíčková, 2012). After reaching the required weight loss and after lowering water activity to a_w lower than 0.93, the sausages are dispatched.

1.2. Market research

As of November 2016, thirty registered producers of TSGs operate in the Czech Republic (SVS 2016). These producers are represented in Figure No. 1.1 according to the size of the company. Company categorization is in compliance with EU Regulation (Regulation (EC) 800/2008). Micro-enterprises are defined as enterprises which employ fewer than 10 persons, small enterprises employ up to 50 employees, medium-sized enterprises employ up to 250 employees and large enterprises employ over 250 employees.

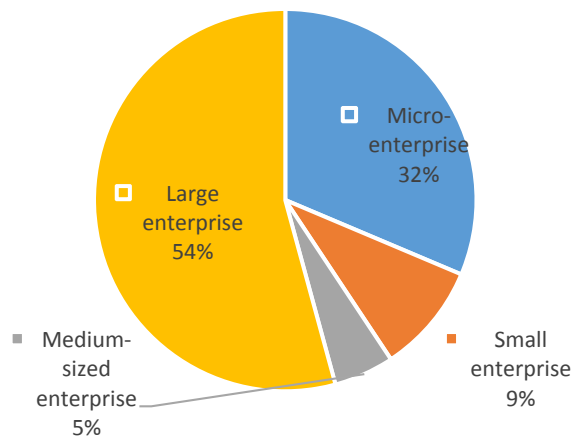


Figure No. 1.1: Enterprises producing TSGs by size.

This figure indicates that TSGs are primarily in the portfolio of production of medium-sized and small enterprises. The reason for smaller representation of micro-enterprises is likely lower confidence in the TSG labelling as well as the required administrative burden which is necessarily bound to using the TSG logo.

As reported by the State Veterinary Administration (SVA), any manufacturer intending to start producing TSGs is required to inform thereabout the competent supervisory authorities of the Member State in advance. As for the food of animal origin, the competent supervisory authorities in the Czech Republic are territorially competent local branch offices of the State Veterinary Administration (KVS SVS / MěVS SVS). Prior to market launch, the competent SVS branch office performs an inspection pursuant to a notification in order to verify compliance with the specifications of the production process. Costs incurred for verifying compliance with the specifications shall be borne by the food producing enterprise operator. The flat fee for verifying compliance with the specification amounts to CZK 500 per each inspector for each additional hour of performing the inspection. Subsequent inspections to verify the compliance with the specifications in the marketing of the product take place once a year. These follow-up checks are not paid. The purpose of these inspections is to ensure that products labelled as TSGs actually meet the conditions set out in the specification and thus the consumer receives the product of guaranteed quality by all manufacturers of products labelled as TSGs (Potraviny s chráněným názvem, 2016).

The project also contained conducting a market research in the Czech Republic, in which a total of 64 students and teachers of the University of Veterinary and Pharmaceutical Sciences in Brno took part. Within this research it was i.a. discovered that the majority of TSGs produced in the Czech Republic came from four producers only. Namely, they came from three large producers and one medium-sized producer. Part of the products was manufactured under a private brand, whereas it was the same four producers who sell the TSGs under their own brand as well. A certain portion of the products came from Slovakia. This applied to the products of Spišské párky and 'Lovecký salám'.

With regard to the possibility of selling TSGs without name reservation, we came across a different representation of enterprises manufacturing products named like TSGs in the market network, see Figure No. 1.2.

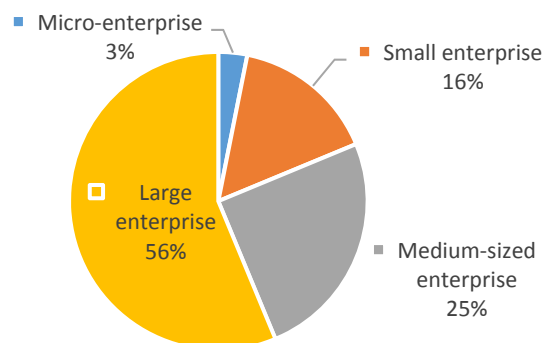


Figure No. 1.2: Enterprises manufacturing products without the TSG labelling by size.

The figure shows that there is significantly greater participation of large enterprises. The main reason is the representation of private brands of large retail chains that prefer producers that meet strict quality criteria, are able to deliver large quantities of products, and last but not least also offer products at a lower purchase price.

Within the market research, 118 stores throughout the country were assessed. The assessed stores could be of the same name but differed in location. Companies for assessment were selected to represent local shops, trade associations and small butcher shops. Representation of these enterprises is shown in Figure No. 1.3. The predominantly visited stores were among the large enterprise category. The second largest group were micro-enterprises. An interesting finding is the small proportion of medium-sized and small enterprises. These facts show that in the Czech Republic there are rather large food stores but small shops employing up to 10 people are still commonly encountered.

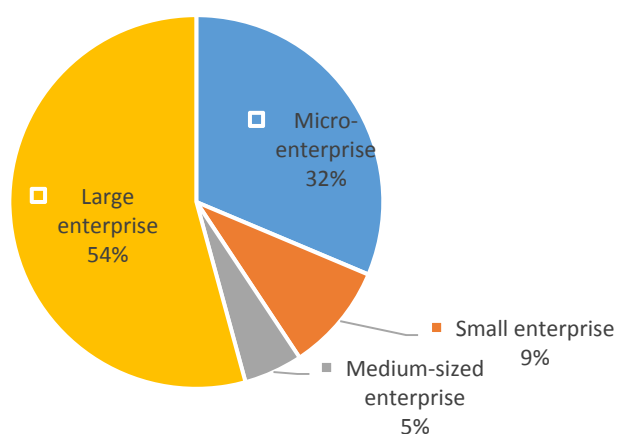


Figure No. 1.3 Representation of enterprises in the Czech Republic by size

Representation of marketed food products labelled with TSG logo and food products without it using the same or similar names is illustrated in Figure No. 1.4. Only a small portion of the stores offered none of the monitored meat products. There was roughly twice as much products without the TSG labelling than products with it. This finding points to the fact that the monitored products popularity in the Czech Republic is high, while the interest in TSG labelling is low. This situation results

probably from to the choice of a wider range of raw materials for manufacturing in case the traditional product is not made using the traditional recipe and traditional ingredients. The manufacturer, of course, does not commit adulteration if they comply with the existing national legislation (Decree No. 69/2016), but they can use lower-quality raw materials. Thus, if consumers are not aware of the relevance of TSG logos, they prefer cheaper products of identical or similar names, which is a likely reason for lower popularity of TSG products in the market network.

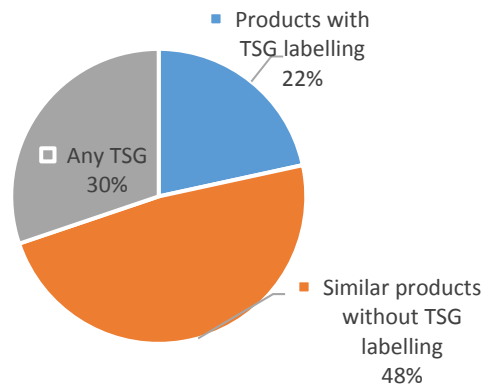


Figure No. 1.4: Representation of marketed products with TSG labelling, products without TSG labelling but with identical or similar names, and products that do not belong into this group.

An important parameter monitored in the market network focused on which TSGs are sold in stores. Representation of products with the TSG label is illustrated in Figure No. 1.5. The figure shows that the most popular are ‘Špekáčky’ and the second are ‘Spišské párky’. An interesting fact is also that 100% of ‘Lovecký salám nad ‘Liptovský salám’ came from abroad, 27% of ‘Spišské párky’ came from abroad and 21 % of ‘Špekáčky’ came from abroad. These included Spanish Chorizo and Hungarian Csabai kolbász that belong into the category of PGI. Slovak TSGs which are also registered in the Czech Republic, are not counted in this group. From among Polish TSGs or Slovak dairy TSGs that are registered only in Slovakia, none were found in the Czech market network. This fact points to the low experience of Czech consumers with foreign TSGs and therefore also with other V4 countries. ‘Lovecký salám’ marked with the TSG logo was made by Slovak producers.

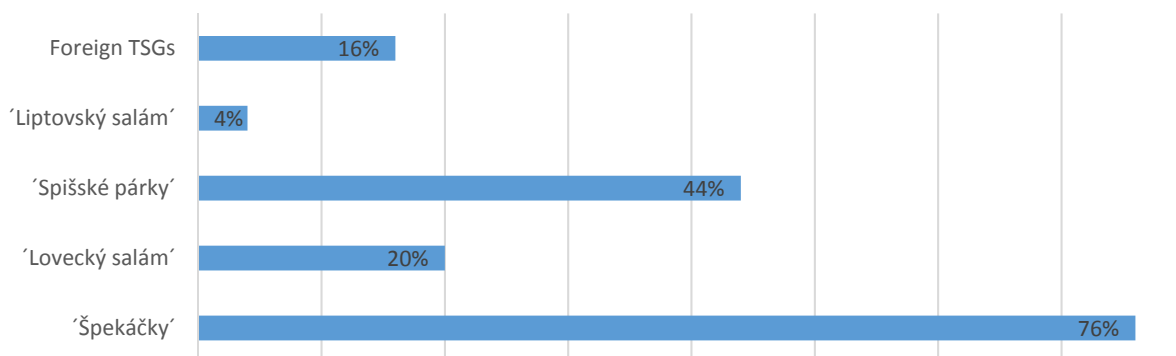


Figure No. 1.5: Representation of TSG products in the market network

Representation of products with the same name but without the TSG label was different, see Figure No. 1.6. A significant share in this group covered ‘Lovecký salám’. This finding points out that Czech manufacturers prefer producing ‘Lovecký salám’ without marking it with the TSG logo. The reason in this case is high cost of producing it in compliance with the traditional recipe. Thus, the possibility to buy this product produced according to the traditional recipe is considerably limited on the Czech market, and one mostly comes across its cheaper substitutes. Stores selling products bearing

the TSG logo usually did not sell these products only. In 75 % of these stores it was also possible to buy a product of identical name without TSG labelling.

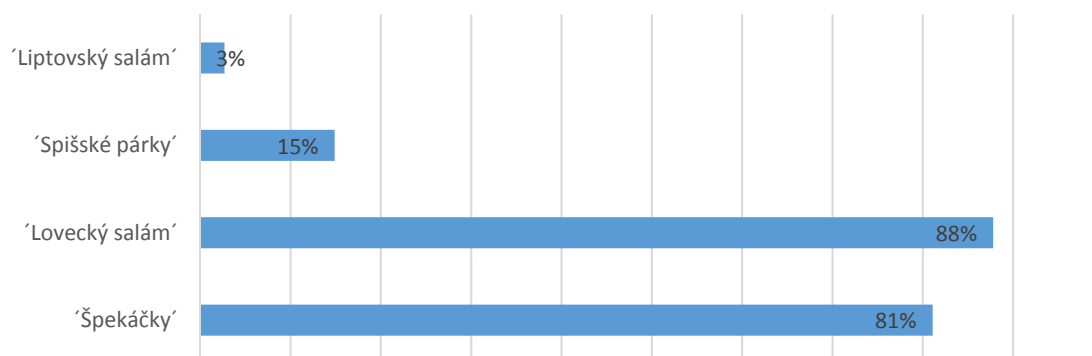


Figure No. 1.6: Representation of products with identical names in the market network

As mentioned before, the traditional products also include products such as 'Pražská šunka' and 'Dunajská klobása'. These products cannot be marked with the TSG logo yet. Although an application for this logo for 'Pražská šunka' has already been filed. Representation of these products is shown in Figure No. 1.7.

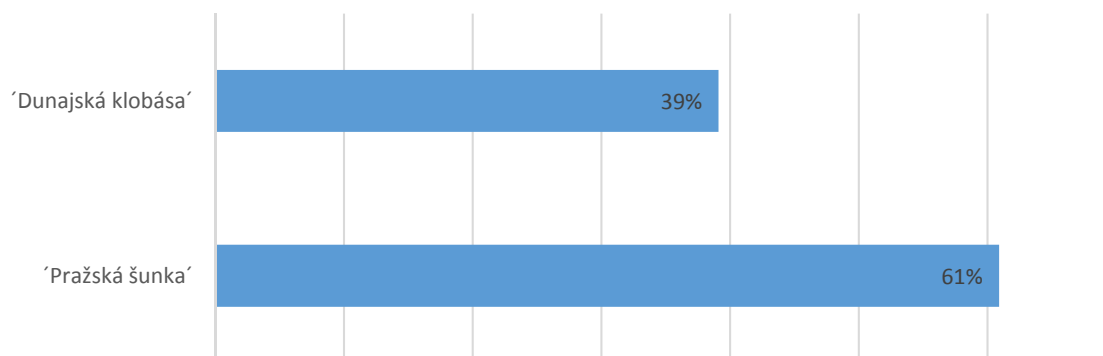


Figure No. 1.7: Representation of other traditional meat products in the market network

In the case of products with identical names to TSGs, it was also verified whether their composition is identical for both, the TSG- and non-TSG-labelled product. The results are summarized in Figure No. 1.8. In some cases, the corresponding composition of the TSG- and non-TSG-labelled product could not be determined. This occurred mainly in cases where the manufacturer declared the use of meat but without its percentage. A specific ratio of individual ingredients used for the TSGs is defined in the applicable EU regulation, however, the applicable national provisions only define permitted or forbidden ingredients. For 'Špekáčky', the meat proportion was often declared, but in 72 % samples it was not in line with the traditional production. In 'Lovecký salám', 'Spišské párky', and 'Liptovský salám' it was mostly impossible to determine the composition at all. Based on the collected data it can therefore be concluded that in case of choice of products with identical names, consumers fail to take into account whether the composition is similar to the TSGs. There might be a number of reasons, of course. Possibilities include the preference for low prices, lack of interest in the composition of products, or ignorance of the composition of traditional products.

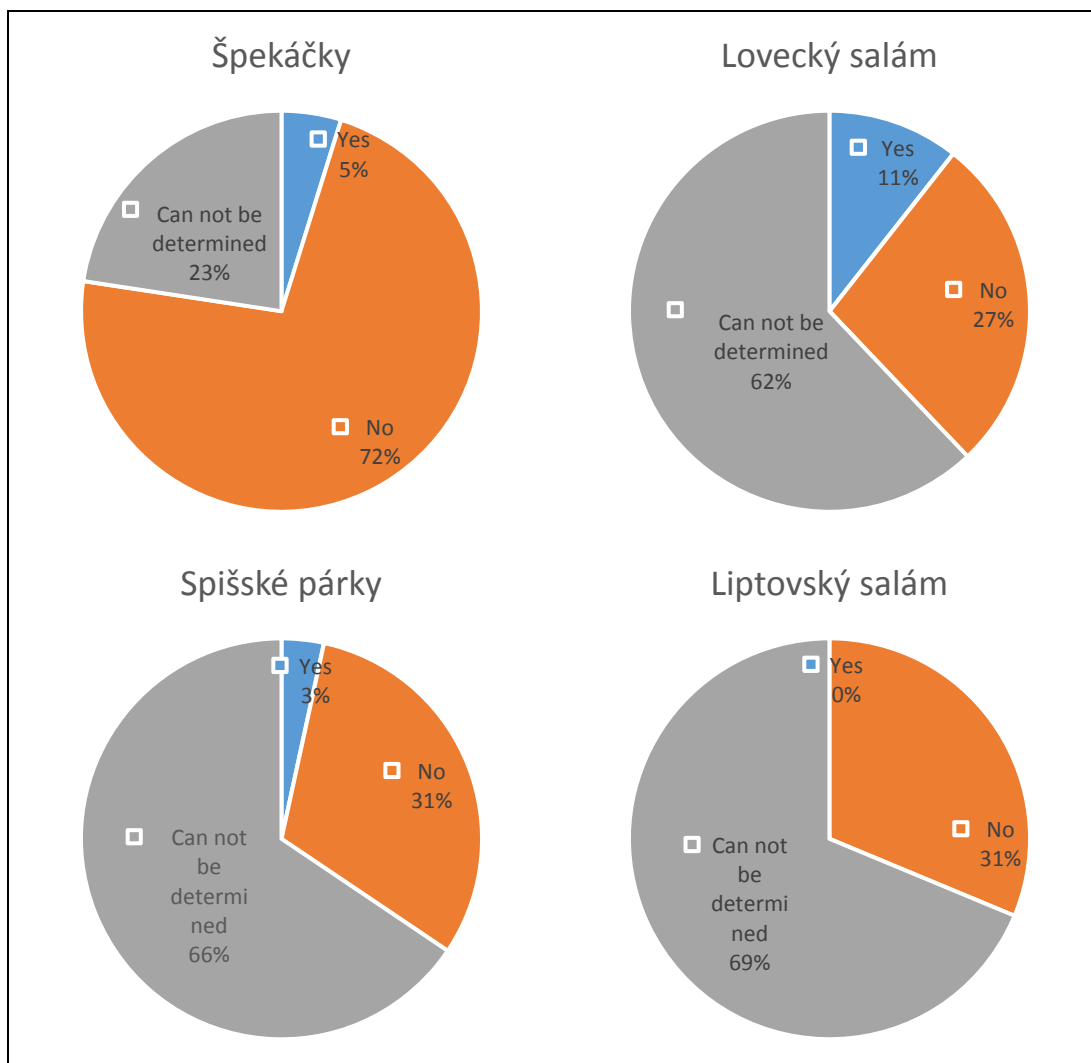


Figure No. 1.8: Correspondence of composition of TSG- and non-TSG-labelled products with identical names

Moreover, the research of the Czech market assessed the level of TSG awareness of professional or auxiliary staff. They were asked whether they had seen the TSG logo before, and whether they knew what it indicated. The research explored that 74.4 % of employees do not know what the TSG logo means. This fact highlights the lack of information on TSGs and points to the need to improve awareness of the brand. Results are displayed in Figure No. 1.9.

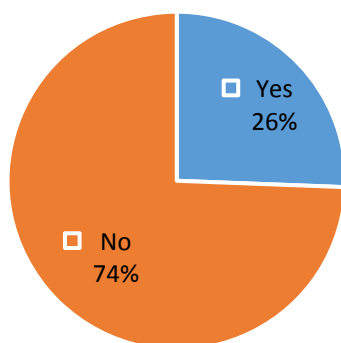


Figure No. 1.9: Staff awareness about the TSG labelling and related issues

1.3. Information from inspection bodies

In the Czech Republic, there are two national organizations devoted to performing the entry inspections before production starts and later monitoring of TSGs. These are the State Veterinary Administration (SVA, orig. Státní veterinární správa) and the Czech Agriculture and Food Inspection Authority (CAFIA, orig. Státní zemědělská a potravinářská inspekce) as competent authorities to perform inspections depending on the commodity. Given the fact that TSGs registered in the Czech Republic are meat products only, all of them fall into the powers of SVA.

If a producer or an association of food producers or another entity, such as a natural or legal person, intends to sell or produce a TSG not yet registered in the list of European Commission (EC), an application must be submitted to have it registered in the list maintained by the European Commission. The application for registration is submitted to the Ministry of Agriculture of the Czech Republic (if a TSG is concerned). Here the application is examined, completed and sent to the European Commission. The European Commission issues this application as an EC Regulation and publishes it in its Official Journal and in the DOOR database (available at: <http://ec.europa.eu/agriculture/quality/door/list.html>). Natural and legal persons of all Member States have a period of three months to raise objections to the proposed registration. If there are no objections within this period, the Commission issues a Regulation on the registration of the name in the list of TSGs (Sedláčková, 2016).

Any manufacturer intending to start producing TSGs is required to inform thereabout the competent supervisory authorities of the Member State in advance. Regarding foods of animal origin, State Veterinary Administration is the competent authority in the Czech Republic through its local branch offices. Prior to market launch, the competent SVA branch office performs an inspection pursuant to a notification in order to verify compliance with the specifications of the production process. Costs incurred for verifying compliance with the specifications shall be borne by the food producing enterprise operator. The flat fee for verifying compliance with the specification amounts to CZK 500 per each inspector for each additional hour of performing the inspection (Sedláčková, 2016).

Subsequent inspections to verify compliance with the specifications in the marketing of the product take place once a year. These follow-up checks are not paid. The purpose of these inspections is to ensure that products labelled as TSGs actually meet the conditions set out in the specification and thus the consumer receives the product of guaranteed quality by all manufacturers of products labelled as TSGs. SVA also performs random checks in the market network and checks based on initiatives of third parties. Alternatively, if there is a special inspection announced, specific subjects to be inspected are determined for this particular event.

Within the framework of TSG inspections, the Czech Republic cooperates with other EU Member States on the basis of general cooperation between supervisory authorities of individual Member States. Targeted cooperation within V4 or another type of cooperation with the V4 countries is not going on. Due to outstanding relationships with Slovakia, we also share information within our bilateral cooperation.

Information about violations of quality or safety of TSGs within V4 or seizures in these countries is shared through AACS or RASFF systems (rapid alert systems) in cases when safety might have been or was breached. Information in the systems are general on any food, thus they also contain information on TSGs. Targeted information about TSGs are not shared.

In TSG inspections, SVA discovered the following inclopiances: From 2013 up to the present three cases were recorded, all of 2014. In two cases 'Spišské párky' failed to comply with the parameter of minimum content of net muscle protein, and in one case 'špekáček' failed to comply the parameter.

The University of Veterinary and Pharmaceutical Sciences Brno was founded on December 12, 1918 by Act no. 76/1918 Coll. upon the creation of the Czechoslovak State Veterinary University in

Brno. It was the first university to be formed after the creation of the Republic of Czechoslovakia. It was founded within the premises of what had once been cavalry barracks and a provincial training school. The university's founder and first rector was Prof. MUDr. et MVDr. h.c. Eduard Babák. Classes began on November 17, 1919. From its inception, the university developed as a single-faculty university aimed at veterinary medicine (veterinary sciences). In 1975 two colleges were created: the College of General Veterinary Medicine (later renamed College of Veterinary Medicine) and the College of Veterinary Medicine – Food Hygiene (later renamed Veterinary Hygiene and Ecology). In 1990, two faculties were created – the Faculty of Veterinary Medicine, focused on veterinary medicine, and the Faculty of Veterinary Hygiene and Ecology, aimed at veterinary hygiene. In 1991, a third faculty was added – the Faculty of Pharmacy, geared towards human and veterinary pharmaceutical sciences. Since 1994, the university has been officially called the University of Veterinary and Pharmaceutical Sciences Brno.

The Faculty of Veterinary Hygiene and Ecology is nowadays traditionally bound by a realized study programme of Veterinary Hygiene and Ecology with the issue of food hygiene and technology and this programme is included among university fields with international quality control of education in accordance with the requirements prescribed the Directive 36/2005/EC, on the recognition of professional qualifications. Even the first evaluation in 1995, which the faculty underwent within the international evaluation of the education level by the European Association of Establishment for Veterinary Education – EAEVE, appreciated the teaching process at the faculty and stated that the veterinary education in the field of veterinary hygiene is one of the best that are offered to students at any European veterinary school.

The mission of the Faculty of Veterinary Hygiene and Ecology ensues from the history of veterinary hygiene at the VFU Brno and constitutes a valuable heritage into the future. Rapid development of food hygiene, especially in the area of veterinary food hygiene has been profiling already since the new millennium. This trend has been accompanying developed economics of the EU and also represents the worldwide trend. In many cases it is a reaction to food disorders, very sensitively perceived by consumers and publicized in the media. Reflections to these facts are essential measures by the EU on all levels ensuring safe and good-quality food. Together with creating unified Europe this effort necessarily projects into the veterinary hygiene in the Czech Republic. It is obvious that capturing of these trends is necessary to accentuate while preparing the experts in the field of food hygiene, so as they could succeed in the competitive international environment. Education of exactly these experts is a task of the Faculty of Veterinary Hygiene and Ecology of the University of Veterinary and Pharmaceutical Sciences Brno, which represents university educational as well as research background for the field of veterinary food hygiene in the Czech Republic and nowadays is the only so oriented veterinary educational institution not only in our country but also within Europe. (Vorlová, 2016).

The Department of Plant Origin Foodstuffs Hygiene and Technology is focused on study of structure, composition and microscopy of various foodstuffs, not limited to plant origin. Research activities are connected with this field and build on previous experience and also create the background for teaching above subjects. Furthermore, research activities of the department focus on food quality and supervision of health and wholesomeness of plant foodstuffs. Department is interested mainly in assessment of impact which determines the resulting sensory quality of food of plant origin after technological processing and during storage.

1.4. Material and methods used as part of the project

University of Veterinary and Pharmaceutical Sciences Brno performed histological examination of the samples. Histological examination was performed in all meat products by the following sampling. 4 partial samples were taken from each sample. Each partial sample was embedded into paraffin. Each paraffin block was cut in RM 2255 microtome (Leica, GER) into 4 µm thin sections. Trimming was 50 µm. Two sections were cut from each block for PAS-Calleja and Alizarine Red staining. In total, 8 sections were prepared of each sample.

Products from the Czech market are described in table 1.1.

Table 1.1. Products from the Czech retail market

No.	Name of the product	Size of producer	TSGs labeling
191/16	‘Špekáček’	Medium-sized enterprise	Yes
192/16	‘Špekáček’	Micro-enterprise	No
193/16	‘Pražská šunka tinned’	Large enterprise	No
194/16	‘Pražská šunka boneless’	Large enterprise	No
195/16	‘Spišské párky’	Large enterprise	Yes
196/16	‘Spišské párky’	Large enterprise	Yes
197/16	‘Lovecký salám’	Large enterprise	No
198/16	‘Lovecký salám’	Medium-sized enterprise	No
199/16	‘Dunajská klobása’	Large enterprise	No
200/16	‘Dunajská klobása’	Large enterprise	No

PAS Calleja staining was performed according to the following procedure: rinsing in xylene for 10 min.; rinsing in ethanol 100 % w/w with ether, 2/3+1/3 for 10 min.; washing in distilled water; immersing in acidum lodicum 0.5 % w/w; washing in 70 % w/w ethanol; rinsing in Schiff reagent for 10 min.; washing in tap water for 15 min.; immersing in Nuclei Red for 30 min.; washing in tap water; immersing in B-Calleja solution for 5 min.; washing in 96 % aqueous ethanol (w/w) for 5 min.; washing in absolute ethanol for 5 min.; washing in xylene p.a. twice for 5 min. Finally, each section was mounted with solacryl and a microcoverslip was laid thereon.

Content of starch and Hydrocolloids was qualitatively evaluated using this method.

Alizarine Red staining was performed according to the following procedure: rinsing in xylene for 10 min.; rinsing in ethanol 100 % w/w with ether, 2/3+1/3 for 10 min.; washing in acidum aceticum 1 % w/w; washing in distilled water; immersing in picric acid-alizarin solution for 3 min.; washing in distilled water; immersing in indigo carmine for 2 min.; washing in distilled water; washing in 96 % aqueous ethanol (w/w) for 5 min.; washing in absolute ethanol for 5 min.; washing in xylene p.a. twice for 5 min. Finally, each section was mounted with solacryl and a microcoverslip was laid thereon.

Content of bone fragments was quantitatively evaluated using this method. Results were expressed as the amount of bone fragments per 1 cm². Using this method, the presence of < 0.2 bone fragments is considered a negative result, 0.2–1.5 dubious and > 1.5 positive for mechanically separated meat (MSM) (Ketteritzsch, 2007). Bone tissue was identified by red precipitate.

All stained sections were examined in the Eclipse E220 light microscope (NIKON, JPN) at 40 and 100 times magnification.

1.5. Results and discussion of products from Czech market

The results of analyses performed within the project are a summary of results from all the project partners. Methods for individual analyses are therefore always given in the ‘material and methods’ section of the partner, i.e. not in the common summarizing section.

Evaluation reflects practices in each country and due to that only products purchased in the Czech retail network are evaluated in this chapter. This does not mean, however, that all of them are manufactured in the Czech Republic. TSGs can be produced by any manufacturer registered with the competent supervisory authority.

‘Spišské párky’ bought in the market network were all marked with the logo of TSG and thus they should have been produced in compliance with the recipe set out in the applicable regulation (EC No.:

SK-TSG-0007-0051-18.01.2007). The examined parameters as results of the analyses are presented in table no. 1.2.

Table 1.2: Results from analysis of 'Spišské párky' bought in the Czech retail market

Sample	Marked as TSG	Chemical analysis				Histological analysis				
		Dry matter	Fat w	Proteine	Salt	Starch	Hydrocolloid	Bone fragment	MSM	paprika
195/16 Spišské párky	Yes	35,94	18,77	13,24	1.81	No	Yes animal protein	0	No	yes
196/16 Spišské párky	Yes	40,05	20,22	15,70	2.03	Yes	Yes	0,69	dubious	yes
Legislative limits		NA	max. 24±4 %	min. 10 %	max. 2±0.4 %	No	No	NA	No	Sweet and hot paprika

Results for the product of 196/16 'Spišské párky' show that the process declared in the specification for the product was breached. Specifically, starch was used in the product. Also, lower quality raw material might have been used in this product, which is indicated by a higher content of bone fragments. However, this item cannot be considered positive for the use of MSM (Ketteritzsch 2007). Salt content in this product is also higher but still within the tolerable deviation of the legislation (EC No.: SK-TSG-0007-0051-18.01.2007). Higher amounts of salt may be used to enhance product flavour with regard to the use of starch and less quality ingredients. A similar finding was made by other authors (Marcinčák a kol, 2014) who also confirmed the presence of starch in 'Spišské párky'. The sensory evaluation (Figure 1.10) also implies that the saltier product with unpermitted addition of starch achieved better evaluation than the product produced in compliance with the requirements (Table no 1.2.) Values of the other monitored parameters were in line with the requirements on 'Spišské párky', and paprika was used as the principal spice in all products.

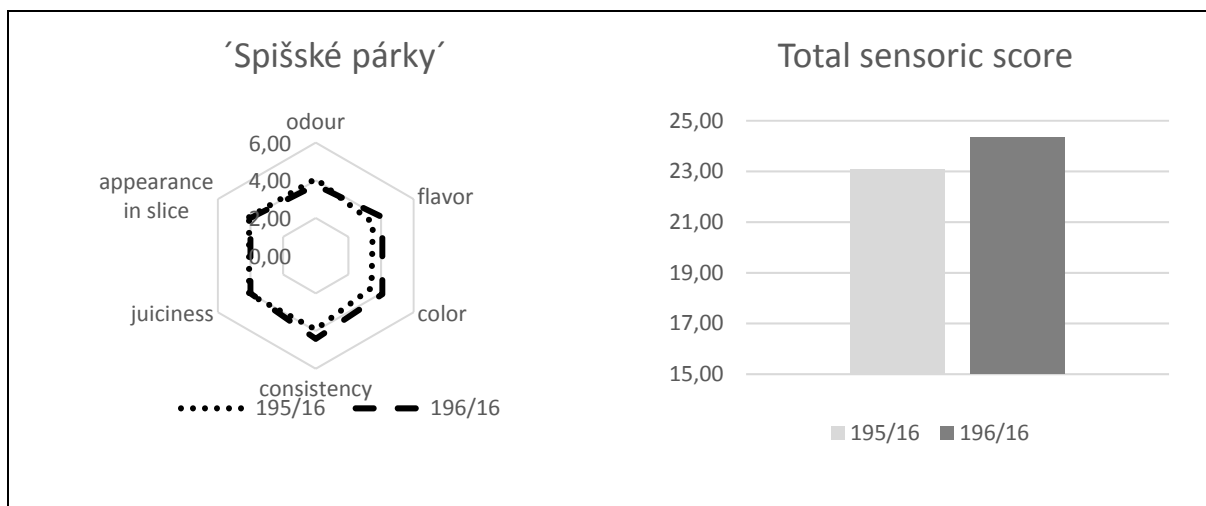


Figure 1.10: Sensory comparison of 'Spišské párky'

'Špekáčky' are a product without name reservation according to (EC No.: SK-TSG-0007-0055-21.05.2007). Thus, we can meet 'Špekáčky' with the TSG logo as well as without it in the market network. Within the comparison, we evaluated one product with TSG logo and one without it. Results are presented in table 1.3 including the monitored legislative requirements.

Table 1.3: Results from analysis of 'Špekáčky' bought in the Czech retail market

Sample	Marked as TSG	Chemical analysis				Histologic analysis				
		Dry matter	Fat w	Protein e	Salt	Starch	Hydrocolloid	Bone fragment	MSM	Red paprika
191/16 Špekáček	Yes	49,41	32,16	11,92	2.07	Yes	No	1,66	Yes	Yes
Legislative limits		NA	max. 45%	min. 6%	max. 2,5%	max. 2,5%	No	NA	No	NA
192/16 Špekáček	No	49,25	33,70	11,58	1.86	Yes	Yes soy protein	1,08	dubious	Yes
Legislative limits		NA	max. 45%	NA	NA	NA	NA	NA	No	NA

The results show that the chemical parameters of 'Špekáčky', regardless of the TSG logo, were in compliance with the requirements of both, the regulation as well as decree (Vyhláška 69/2016). However, they also imply that the product with the logo of TSG 191/16 'Špekáček' was produced using MSM which is banned for this type of product. On the other hand, bone fragments found in 192/16 'Špekáček' not labelled with the logo also indicates a higher portion of lower quality raw material or addition of MSM. Moreover, soy protein was used in this product as well, which increases the amount of nitrogen compounds used for the calculation of net muscle protein. Nevertheless, the presence of soy protein was not duly marked according to the decree (Vzhláška 69/2016) and consumers were thus misled. Based on the sensory evaluation, the TSG product was evaluated as better in spite of containing the banned MSM raw material, see Figure 1.11. The reason may be higher salinity but also higher

amount of natural spices detected in the histological analysis. The detected spice included black pepper and nutmeg. Both of them are required spices in compliance with the TSG registration.

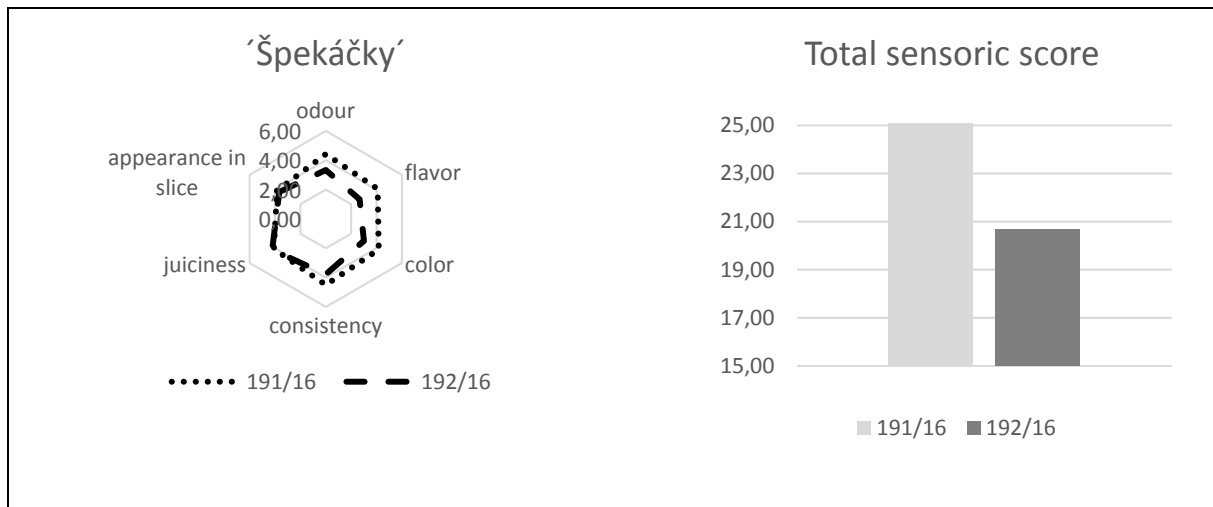


Figure 1.11: Sensory comparison of 'Špekáčky'

'Lovecký salám' is another product without name reservation. Paradoxically, in the Czech Republic production of this popular product without the TSG logo is preferred. The reason is the recognized recipe which the producers do not want to follow with respect to the end product price. Results are summarized in table 1.4.

Table 1.4: Results from analysis of 'Lovecký salám' bought in the Czech retail market

Sample	Marked as TSG	Chemical analysis				Histological analysis				
		Dry matter	Fat w	Protein e	Salt	Starch	Hydrocolloid	Bone fragment	MS M	Starter culture
197/16 Lovecký salám	No	78,76	44,90	22,01	3.38	No	No	0,08	No	Yes
198/16 Lovecký salám	No	69,82	38,06	22,71	3.78	No	No	0,39	No	yes
Legislative limits		NA	max. 45%	min. 15 %	max. 4,2 %	No	No	NA	No	Yes

The results show that producers did not diverge from the recipe for registered TSG as well as the effective legislation of the Czech Republic (Vyhláška 69/2016) in any case. But one can assume that the ratio of beef and pork meat used differs. This fact is also highlighted by the finding of the market network, when the composition could not be compared in 66 % of cases, see figure no. 1.8. The histological analysis further demonstrated pepper which is also part of the recipe for registered TSG. The presence of starter culture points to the product character as a fermented product, their use is also in line with the TSG application. As it was impossible to purchase products with the TSG logo in the Czech retail network, only two products without the logo were compared, see figure 1.12. The

results demonstrate that product of 197/16 'Lovecký salám' containing more fat and less salt was evaluated as more palatable.

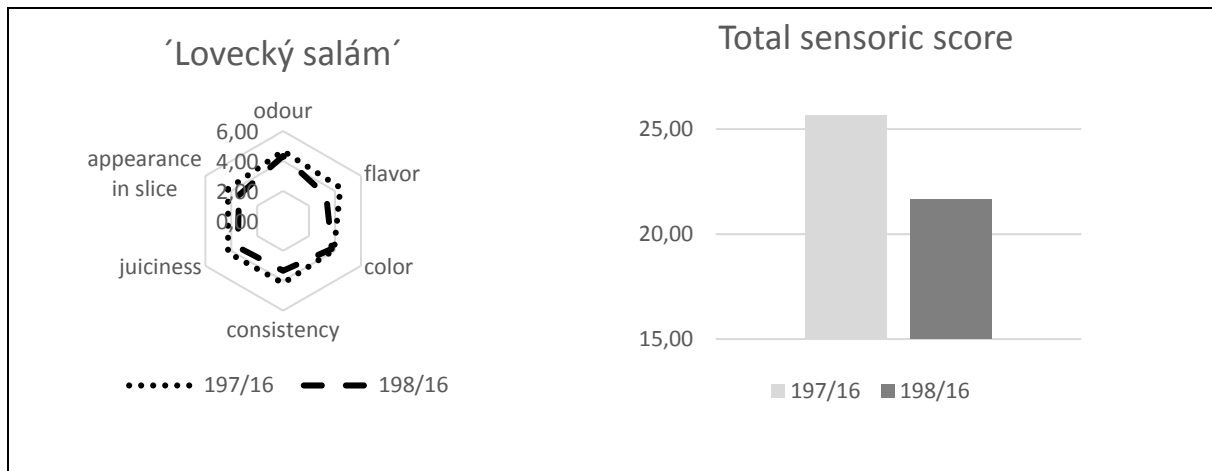


Figure 1.12: Sensory comparison of 'Lovecký salám'

'Pražská šunka' is a product for which the application for registration as a TSG was submitted. One representative for each, 'Pražská šunka' boneless and tinned, was evaluated. For comparison we used parameters included in the registration of TSG for 'Pražská šunka'. The results of the analysis show that neither of the analysed products is manufactured according to the TSG application. In the case of 194/16 'Pražská šunka' boneless, starch was used. Its use is permitted neither by the TSG recipe nor by the valid legislation of the Czech Republic (Vyhláška 69/2016), since the product is classified as ham of highest quality, see table 1.5. In this class, it is prohibited to use both, fibre and starch, including starch modified physically or by enzymes. For sample of 193/16 'Pražská šunka' tinned, the presence of hydrocolloids was confirmed and the presence of starch was evaluated as doubtful. The quantity of starch present was small and rather refers to the use of starch as a carrier for the spice extract. Another exceeded indicator was fat content that was higher than that permitted by the TSG registration application.

Table 1.5: Results from analysis of 'Pražská šunka' bought in the Czech retail market

Sample	Marked as TSG	Chemical analysis				Histological analysis				
		Dry matter	Fat w	Protein e	Salt	Starch	Hydrocolloid	Bone fragment	MSM	Spice
193/16 Tinned Prague ham	No	31,83	6,70	23,27	1.89	Dubious	Yes	0,36	dubious	No native form
Legislative limits		NA	max . 4 %	min. 16 %	max . 3%	No	No	NA	No	Yes
194/16 Boneless Prague ham	No	28,00	4,64	17,28	1.84	Yes	no	0,05	No	No native form
Legislative limits		NA	max . 15 %	min. 15 %	max . 3%	No	No	No	No	Spice extract or oil

Both types (variants) were sensorially compared. Better evaluation was reached by 'Pražská šunka' boneless, see figure no. 1.13. A distinctive difference was recorded in the appearance when cut, when the coherence of the 193/16 'Pražská šunka' tinned was severely disrupted and the product started to fall apart. Also, the colour of the products was not tempting for the evaluators.

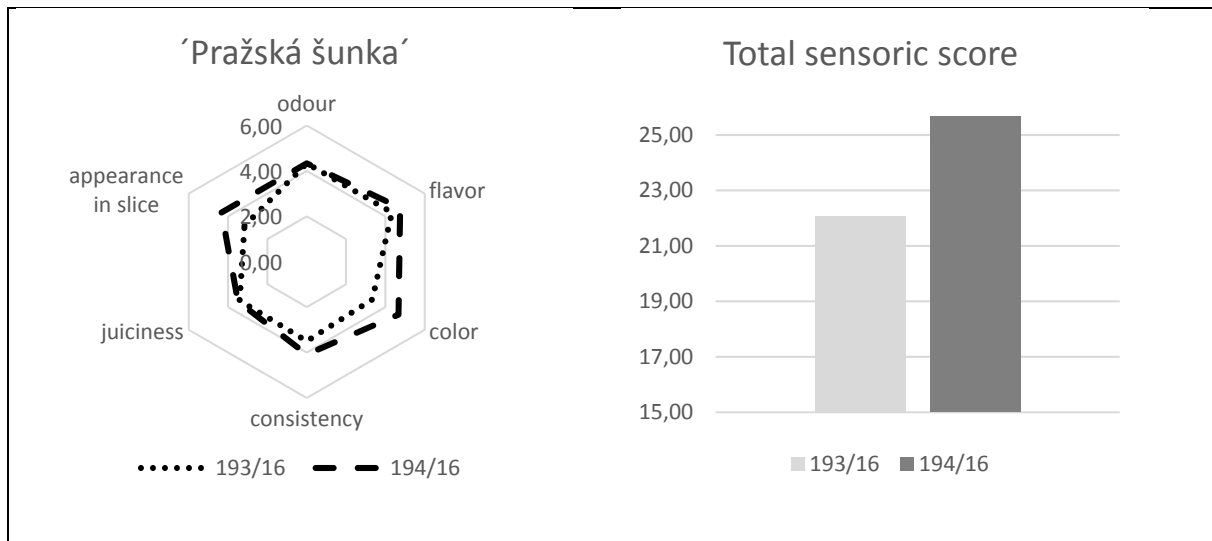


Figure 1.13: Sensory comparison of 'Pražská šunka'

The final Czech product assessed was 'Dunajská klobása' which can be considered traditional for the Czech Republic though TSG registration application has not been filed for it yet. The results are summarized in table 1.6.

Table 1.6: Results from analysis of 'Dunajská klobása' bought in the Czech retail market

Sample	Marked as TSG	Chemical analysis				Histological analysis				
		Dry matter	Fat w	Protein e	Salt	Starch	Hydrocolloid	Bone fragment	MS M	Starter culture
199/16 Dunajská klobása	No	83,78	45,10	25,00	3.66	No	No	0,11	No	yes
200/16 Dunajská klobása	No	74,51	47,16	18,11	4.00	No	No	0,2	No	yes
Legislative limits		NA	max. 55 %	min. 14 %	NA	No	No	NA	No	NA

No monitored parameter in 'Dunajská klobása' exceeded the specified limits. The presence of starter culture points to its character as a fermented product, just like the 'Lovecký salám'. The histological analysis further demonstrated the use of pepper, paprika, as well as caraway, which is a traditional seasoning for the Czech Republic. Sensory comparison is summarized in Figure 1.14. 199/19 'Dunajská klobása' was evaluated as more palatable.

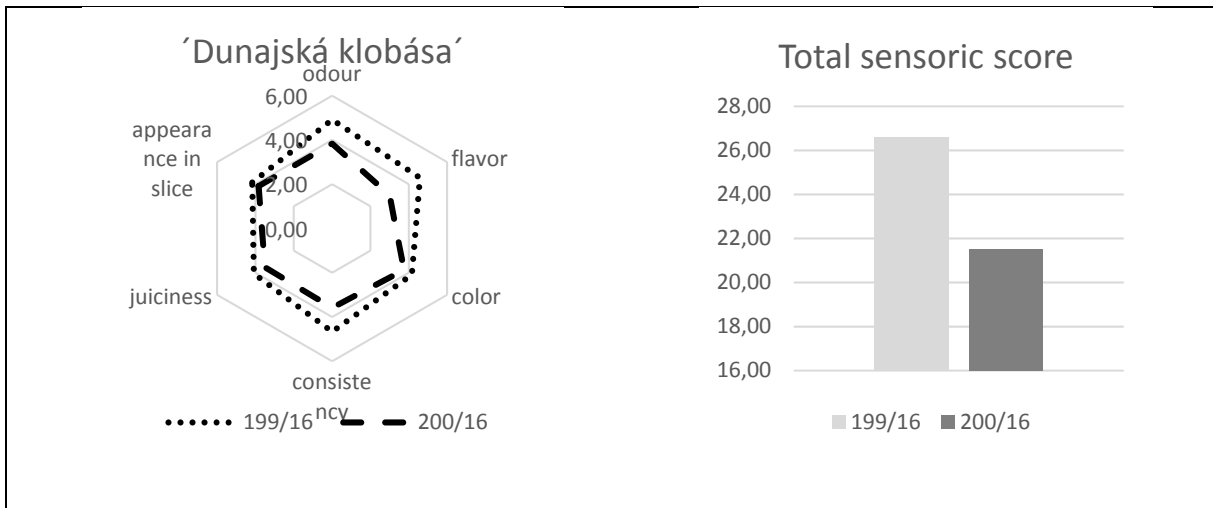


Figure 1.14: Sensory comparison of 'Dunajská klobása'

2. Traditional Specialities Guaranteed in Hungary

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1. Description of the Hungarian TSG product 'Tepertős pogácsa' (Crackling patty)

1.1. Historical background

The word 'Pogácsa' (scone) was first used around 1395, and originally meant a girdle-cake-bread baked in ash and embers. In Hungarian folk tales it became popular as 'Hamuban sült pogácsa' (scones baked in ash). Until the 18th century, the word used for the girdle-cake-bread eaten as bread was scone-bread. The current, smaller, cylindrical, cut variety became popular in Hungary in the late middle ages. It was the most popular bakery product of Hungarian peasant cuisine and was made in several varieties, and its popularity has not faded ever since.

Two conditions enabled the development of 'Tepertős pogácsa': frying fat from bacon became a common activity and crackling became an everyday food. According to a description of a middle-ranking noble family of the 1770s, frying bacon and making cracklings became part of the household of noblemen from the 18th century. This is supported by the fact that, according to the property inventory of noble families, fat/lard firkins started to appear in the Great Plain from the 18th century. (Cegléd 1850-1900. Publication of Cegléd Kossuth Museum - Cegléd, 1988, pp. 28, 30 Szűcs). We can assume that the tradition of frying fat and the use of pig fat as everyday nourishment by peasants and in popular pig processing started to spread from the (mid) 19th century on the basis of the fact that fat/lard firkins were already listed in the peasant registries of the area between the Danube and Tisza rivers in the 1850s.

According to oral ethnographic data from the turn of the 19th-20th century, crackling was used for making soap by peasant households in the Central Tisza region, and consumption developed gradually. After pig slaughter, scones were usually baked with fresh, small, skinless cracklings. An ethnographic summary of the 1930s refers to scones as being made of unleavened and leavened dough, flavoured — among other ingredients — with cracklings (Bátky Zs.: Nourishment - In: Ethnography of the Hungarians - Budapest, 1933, p. 100). Therefore we can say that adding cracklings to leavened dough became common at the beginning of the 20th century.

Nowadays, 'Tepertős pogácsa' plays an important role in everyday cooking. It is served as a second dish with main course soups (goulash, bean soup) and offered to guests at meetings and conferences. It is also a popular choice among housewives, especially to mark family events (weddings, christenings) or feasts such as Christmas and Easter, and is often served as a savoury snack to accompany wine in agro-tourism. (Traditions Tastes Regions -, Vol. I, pp. 145-147.).

Several recipe books have proved its reputation from the 1880s to this day. Dobos C. József: Hungarian-French cookery book - pp. 784-785, 1881; Rozsnyai Károly: Latest great home-made confectionery - p. 350, 1905; Kincses Váncza recipe book - p. 21, 1920; Second recipe book of new times - p. 182, 1934; Hajdú Ernőné: What shall I cook? - p. 73, 1941; Rudnay János: Masterpieces of Hungarian confectionery - p. 89, 1973.

1.2. Processing technology

Depending on the method of production, the 'Tepertős pogácsa' may be the **flaky** or the **short** variety.

1.2.1. Production of short 'Tepertős pogácsa'

A: Preparation of the crackling cream

The fresh, skinless cracklings are flattened with a rolling-pin until no big or coarse pieces remain and the roasted pieces are evenly distributed in the cream. The crackling may be minced with a meat mincer, in which case the finest setting must be used.

The cream and the pig fat are mixed with a wooden spoon or mixer. An important requirement is that no additives, preservatives, goose crackling, vegetable fat or margarine is used to prepare the crackling cream, only fresh, skinless pork cracklings.

Crackling cream produced industrially must also meet the requirements of crackling cream.

B: preparation of the dough

250-400 grams of crackling cream are rubbed into each kilogram of wheat flour to form an even mixture. The crackling cream must cover the flour particles, which is an essential condition for the short texture. All ingredients, that is flour mixed with the crackling cream, 5% yeast activated in milk for each kilogram of flour, one egg, one egg yolk, 0,02% white wine or vinegar, 2,5% salt, 0,001% ground pepper and enough sour cream to obtain a relatively hard dough, are kneaded together. Kneading is continued until the dough binds together. The required short texture will not be achieved if the dough is over-kneaded.

Because of the high fat content of the product, the dough is made from cold ingredients and it must rest in a cool place until the dough's internal temperature reaches 26 °C. The nature of the product also allows the dough to be put into a refrigerator at + 5-+ 8 °C and left for at least three hours to rest.

The risen and cooled dough is rolled to form a finger-thick layer and the top is scored with dense perpendicular lines. This may be done with knives assembled together at a distance of 3 mm from each other. The scones are cut with a scone form of 3-6 cm diameter. The scone shapes should be even and, as far as absolutely possible, cylindrical. The final shape is reached by rolling the dough with the palm heel. The number of scones necessary to fill the oven tray are placed close to each other on the board and are brushed with beaten egg, without allowing it to run down the sides. When the egg has dried on the surface the scones are placed, evenly spaced, on the tray. The shapeless pieces can be kneaded together maximum twice with as little contact as possible and, after letting the dough rest, they may be used later.

The scones are left to rise for 50-55 minutes, then baked in a hot oven at 220-240 °C for 12-15 minutes. The scones are sold without packing (loose) or pre-packed.

1.2.2. Production of flaky 'tepertős pogácsa'

A: preparation of the crackling cream

The preparation of the crackling cream is similar to that used for the short variety, the only difference being that, in addition to fat and skinless pork crackling, 1,5% salt (by weight of the flour) and finely ground pepper (0,001% by weight of the flour) is added. Salt is added at this stage because, if the amount of salt necessary for the characteristically salty taste of the scones was added only when preparing the dough, the dough would break up and the 'mille-feuille' structure would not develop.

In this case, of the quantity of fat indicated for the preparation of the crackling cream, 50%, i.e. half, is added to the crackling cream and the other half to the dough.

B: preparation of the dough

The so-called basic dough is prepared with the fat set aside when the crackling cream is prepared, salt (approximately 1% by weight of the flour), 5% yeast activated in milk for each kilogram

of flour, 0,02% white wine or vinegar, possibly one egg, one egg yolk and enough sour cream to obtain an unyielding dough of medium elasticity, which is easy to roll out.

Keeping the ingredients and the crackling cream at a low temperature is important for this variety so that the crackling cream can separate the dough layers during folding. The fat between the thinly rolled cold dough layers melts during baking and prevents the dough layers from sticking. In the meantime, the water content of the dough and the fat transforms into steam and pushes the layers apart, so that the product can be divided into layers (feuilles) once baked.

The 'mille-feuille' structure may be achieved in two ways.

(a) The crackling cream is smeared evenly on the thinly rolled-out dough, then the dough is rolled up starting from one end. This roll is left to rest for 15-30 minutes, then rolled out once again and rolled up at 90 degrees to the previous rolling. If this rotation is not respected, the scones will tilt when baking.

(b) The ripe basic dough is rolled out thinly, and the crackling mixture is smeared on the exposed parts as many times as the dough is folded. In this case it is not rolled up, but folded (at least three times).

Before the final roll-out the dough is allowed to rest for at least 15 minutes, then it is rolled out in one finger-thick layer (1-2 cm), the top is scored densely with perpendicular lines, and the scones are cut with a scone form of 3-6 cm diameter. The scones necessary to fill the tray are placed close to each other on the board and are brushed with beaten egg with the help of a brush, without allowing the egg to run down the sides of the cylinders.

When the egg has dried on the surface, the scones are placed, evenly spaced, on the baking tray. They are then left to rise for 40-45 minutes and are baked in a hot oven at 220-240 °C for 8-10 minutes.

The scones are sold without packing (loose) or pre-packed.

1.3. Organoleptic characteristics

Texture: short or flaky 'mille-feuille' texture — taste and aroma characteristic of the crackling and mildly peppered

Shape: Short type: round, evenly cylindrical. Flaky type: Round cylindrical, may 'tilt' slightly.

Crust: the top is shiny, reddish brown and densely scored with squares. The side is sand-coloured and mat and the bottom is reddish brown and mat.

Internal structure: Short type: short texture but not crumbly. The crackling pieces are evenly distributed and are slightly brownish in colour. Flaky type: Mille-feuille structure, the layers can be separated and the pieces of the crackling are visible within the layers, slightly brownish in colour.

Taste: Characteristic of the crackling, it has a pleasantly salty, mildly peppered taste.

Aroma: Characteristic of the crackling and the pig fat, peppery.

Organoleptic tests: are performed every shift.

2.1. Market research

'Tepertős pogácsa' (Crackling patty) is a sort of bakery product (scone) and is common with several other types of 'pogácsa' - scones/patties. They usually differ in the ingredients used in the dough. Some examples of 'pogácsa': pumpkin-seed patty, sweet cheese patty, cheese patty, smoked cheese patty, potato patty, cabbage patty, butter patty, sweet cream patty, ham patty, curd patty, sweet patty.

The 'Tepertős pogácsa' (Crackling patty) and usually each sort of patty is offered mainly by smaller shops. In Hungary, it can be stated, that almost each confectionery (pastry shop) and each bakery offers several types of 'Pogácsa' (Patty, Scone), and 'Tepertős pogácsa' too. For example in Hungary there are about 1200 national confectioneries and about 600 foreign confectioneries. Some bigger bakeries that are selling 'Tepertős pogácsa' are the Hungarian 'Lipóti' Bakery, which is a big franchise

bakery chain; The 'Fornetty' Bakery chain and the Princess Bakery chain. Big supermarket chains like Tesco and Auchan are selling 'Pogácsa' raw and frozen that has to be baked by the consumer.

The shop assistants usually are not informed that the 'Tepertős pogácsa' is a TSG, except some smaller bakeries.

2.2. Information from inspections bodies

The inspection body in Hungary for the TSG product is the National Food Chain Safety Office (NÉBIH – Nemzeti Élelmiszerlánc-biztonsági Hivatal) and Central Agriculture Administration Office, Food and Feed Safety Directorate.

The inspection body usually controls the characteristics of food product linked to food-hygiene. Moreover they may control the chemical and organoleptic properties given in the product specification, such as salt content and fat content. The maximum salt content of the 'Tepertős pogácsa' is given to be less than 4% (m/m) in the dry matter. The fat content is specified to be 20-30% (m/m) in the dry matter.

The quality of the TSG products (which is actually only the 'Tepertős pogácsa' / 'Crackling patty') is checked occasionally, randomly. The PDO (Protected Denomination of Origin) and PGI (Protected Geographical Indication) products are checked and analysed continuously by the authority. There are no significant deviations from the product specification. There are analysed all the quality parameters that are given in the product specifications.

Hungary has other traditional food products, especially meat products, which are widespread, even with international reputation. Some of these meat products are:

- Szeged winter salami (PDO) manufactured by a big size company: Pick Szeged Zrt
- Budapest winter salami, (PGI) manufactured by the same company: Pick Szeged Zrt.
- Csabai kolbász / sausage (PGI) manufactured by big size companies like: Gyulai Húskombinát Zrt. and Kaiser Food Kft.
- Gyulai kolbász / sausage (PGI) manufactured by same companies like Csabai kolbász.

All these meat products are also considered as Hungarikums, Hungarian traditional products, and they are sold in all markets, supermarkets and smaller food stores.

Their composition and overall quality is in accordance with the PDO or PGI specification, so they represent a group of food products with special quality.

2.3. Introduction of university

The University of Veterinary Medicine, is the only veterinary school in Hungary. It is a state institution supervised and financed by the Ministry of Education and Culture and is accredited to issue the diplomas of Doctor of Veterinary Medicine (D.V.M.), Bachelor of Science (BSc) in Biology and the postgraduate degree of Philosophiae Doctor (Ph.D.) in veterinary sciences. The Faculty has a fundamental role in teaching in the course of Master of Science (MSc) in biology, too. The Faculty has an uninterrupted teaching record for more than two centuries, making it thus one of the oldest veterinary schools in the world.

Hungary, owing to its plain territories particularly suitable for extensive animal breeding, has always been a large-scale producer and exporter of animals and animal products. From the late middle ages, large herds of cattle and other livestock were driven to the markets of Vienna, Nuremberg, Munich, and the North-Italian municipalities, where Hungarian livestock, particularly horse and cattle,

sold well. The several weeks-long migration to the market places was rather trying for both the animals and the accompanying mounted herdsman who knew where to find pastures with fresh grass and water on the way. They were also experienced warriors capable of defending their valuable goods (and the money on the way back) from the attacks of robbers. This traditional kind of trading lasted until the 16th century, when the expanding Turkish Empire turned the territory of the Hungarian kingdom into a battlefield for the next 150 years.

When the Turks were expelled, a devastated country was left behind. In the late 17th century, Hungary became a condominium with Austria under the Habsburg Emperors. The old commercial routes were revitalized but this time, Hungarian livestock and their warlike herdsman were needed also for the Imperial Army: meat for supplies, horses and horsemen for making the core of the famous Hungarian light cavalry, the 'Hussars'. To this end, enlightened sovereigns of the multinational empire found it necessary to develop a basic infrastructure in Hungary, the domain where their meat, corn, good horses and soldiers came from. A part of these developments was the implementation of a countrywide educational system. New universities were opened and, in 1782 Emperor Joseph II decided to establish a school for veterinary medicine in the city Pest (now part of Budapest).

The role of the University of Veterinary Medicine Budapest is - to transfer information about traditional specialities guaranteed from participant countries among all of participants; - to participate in network events; - to make sampling and examination of a part of quality characteristic of Traditional Specialities Guaranteed; - to present the partial results regarding the quality of TSG product in a conference and in plenary lectures organised by each participant V4 country.

There were collected 29 samples from the four participant countries; TSG and other national traditional food products. The majority of the product samples were meat products – sausages, salamis, hams, etc. (26), some dairy products like cheese (2) and a bakery product, the crackling patty. Hungary analysed the salt content of the samples.

2.4. Results and discussion of products from Hungarian market

One of the specific aims of this V4 project is to check and analyse the quality traits of traditional products in V4 countries. Each Visegrád county analysed the quality, the composition of the traditional products, each of them a different compositional characteristic. In Hungary we have analysed the salt content of the products. The standard methods for the determination of salt content were as follows:

- MSZ ISO 1841-1:2000 for meat products
- MSZ 2714-3:1989 for dairy products
- MSZ 20501-1:2007 for bakery products

The results of the salt content and the other composition data for six Hungarian traditional product sample are as follows (Table 2.1.):

We can state that each product had lower salt content than the maximum limit given in the specification. For the fat content, we have found the limit values for Budapest winter salami and Szeged winter salami. The measured fat content in both cases is lower. From the obtained data it can be stated that the products analysed have proper quality, they fulfil the requirements for traditional products.

Table 2.1: Composition data for the Hungarian traditional food products

Product name (sample number)	Salt content (%)	Salt Limit (%)	Moisture (%)	Dry matter (%)	Fat content (%)	Fat Limit (%)
Gyulai sausage, PGI (213/16)	3,95	5,0	21,33	78,68	43,8	-
Csabai sausage, hot, PGI (214/16)	2,98	4,3	25,65	74,35	45,49	-
Budapest winter salami, PGI (215/16)	4,29	5,0	20,41	79,60	44,55	45
Szeged winter salami, PDO (216/16)	4,03	5,0	22,53	77,48	43,35	46
Csabai dry sausage (217/16)	3,58	-	33,33	66,67	36,15	-
Crackling patty, TSG (218/16)	1,12	2,5	23,05	76,95	15,45	-

3. Traditional Specialities Guaranteed and traditional national products in Poland

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3.1. Description of the products

The market of traditional and regional foodstuff has been evoked by EU integration. The special logos and low protection of products by marks PDO, PGI and TSG inspired the domestic markets to describe and to protect own cultural heritage in food area. Also the local production of such foodstuff betters economy of small, local farms and enterprises giving the work place at the place of birth. The regions rich in a cultural and specific foods offer are better developed. The competitive market concerning food is very difficult for small producers and the specific products give them a way to survive, also creating regional tourist attractiveness (agrotourism; culinary tourism). Contemporary consumer also has changed – there have been observed such trends like: ethnic, local food buying, shopping at the place of food production – directly from the farmer, growing interest in food of ecological origin. The specific traditional and regional products are perceived like having a high quality and nutritional value and aware consumers are willing to pay more for such type of food.

The protection of regional products starts in Poland from such named “ministerial list” where the products are registered after fulfillment of specific rules i.e. proved tradition of production (not shorter than 25 years), ownership of recipe (the applying subjects – producers guarantee their rights of ownership), specificity of production process and/or raw materials and/or seasonings (i.e. herbs typical for the product and/or region of production) etc.

After initial registration the Minister of Agriculture gives the time for “proves” and the Council for Traditional and Regional Names of Agricultural Products and Foodstuff follows the procedure of application estimation and acceptance. At the end of procedure the product/ raw material (plant, seed, fruit)/ technology of production and place of production is allowed to be registered on governmental list which is dedicated separately for each Polish voivodship. Up today the procedure has been passed by 1597 products (the Podkarpackie and Malopolskie voivodships as leaders with more than 200 and 170 products, respectively).

Some of above mentioned products (38 products) were registered further and after fulfilling of EU rules and procedures granted European recognition and protection logo: PDO, PGI and TSG. The PDO were granted 8 products; the PGI were granted 21 products and TSG 9 products

The product granted EU sign of TSG from Poland are, in time order :

1. EU Regulation no. 729/2008, 28 July 2008 HONEYS – ‘Czwórniak’, ‘Dwójniak’, ‘Półtorak’, ‘Trójniak’
2. EU Regulation no. 506/2009, 15 June 2009 ‘Olej rydzowy’
3. EU Regulation no. 567/2009, 29 June 2009 ‘Pierekaernik’
4. EU Regulation no. 379/2011, 18 April 2011 ‘kielbasa jałowcowa’
5. EU Regulation no. 382/2011, 18 April 2011 ‘EU Regulation no. 1044/2011, 19 October ‘Kabanos’

In the scope of our project are 3 of TSG products of Poland – meat products:

3.1.1. 'Kabanos'

Registered by: Związek „Polskie Mięso”. Applicant does not apply for reservation of name according to 13.3 art. Of 509/2006 UE Regulation and does not ask for 13.3 art. Of above Regulation. The name 'KABANOS' is a specific name and is not translated.

Description of the product

'Kabanos' sausages have an outlook of long and thin bars of dry sausage curled into one direction and evenly wrinkled. Sausage bars are half laid and at flexure have trace after hanging (during smoking process). The colour of sausages is dark red with cherry tint. At a slant cut there can be seen dark red meat pieces and light creamy fat particles. The perception in touch is characterised by smooth, dry and evenly wrinkled surface.

The kabanos taste is characterised by distinguished roast, pickled/brined pork meat with coumin, black pepper and smoking after tastes.

The microbiological and physico-chemical characteristics:

- protein content not less than 15,0%
- water content not more than 60,0%
- fat content not more than 35,0%
- salt (NaCl) content not more than 3,5%
- nitrates and nitrites content calculated as NaNO₂ not more than 0,0125%

Composed in such a way components allow for product traditional quality. The yield of ready to eat product has to be lower than 68% as compared to raw meat used. The meat used for production is pork and pork fat (<http://www.minrol.gov.pl/Jakosc-zywnosci/Produkty-regionalne-i-tradycyjne>).

Ingredients

Meat (100 kg of raw material): Class I pork with a fat content of up to 15 % — 30 kg, Class IIA pork with a fat content of up to 20 % — 40 kg, Class IIB pork with a fat content of up to 40 % — 30 kg.

Seasonings (per 100 kg of meat): natural pepper — 0,15 kg, nutmeg — 0,05 kg, caraway — 0,07 kg, sugar — 0,20 kg.

Other additives: curing mix (based on a mixture of table salt (NaCl) and sodium nitrite (NaNO₂)) — about 2 kg.

Stages in the production

Stage 1 Preliminary cutting up of all meat ingredients. Ensuring that the pieces of meat are of a uniform size (about 5 cm in diameter).

Stage 2 Traditional curing (dry method) for about 48 hours, using a curing mix.

Stage 3 Class I meat is reduced to around 10 mm in size, Class IIA and Class IIB meat to around 8 mm in size.

Stage 4 Mixing of all meat ingredients and seasonings: natural pepper, nutmeg, caraway and sugar.

Stage 5 Stuffing into thin sheep casings of between 20 and 22 mm in diameter and twisting-off at one end of sticks of about 25 cm in length.

Stage 6 Settling at a temperature not exceeding 30 °C for 2 hours. Preliminary drying of the surface, 'settling' of the ingredients within the sticks.

Stage 7 Drying of the surface and traditional smoking in hot smoke (for about 150 minutes) and baking until a temperature of at least 70 °C is reached inside the sticks.

Stage 8 Smoking is stopped and the 'kabanosy' are left in the smoke room for about 1 hour, after which they are chilled and refrigerated to below 10 °C.

Stage 9 Drying at 14-18 °C and 80 % humidity for 3-5 days until the desired yield is obtained (not exceeding 68 %).

Specific character of the agricultural product or foodstuff (Article 3(3) of Commission Regulation (EC) No 1216/2007) of 'kabanosy' derives from several attributes that are typical of the product: tenderness, succulence and specific properties of the meat, exceptional taste and aroma, uniform, characteristic shape. The name expresses the specific character of the product. In 19th century Poland and Lithuania the term 'kaban', or the diminutive form 'kabanek', referred to extensively reared young hogs which used to be fattened mainly with potatoes, and the meat they produced was customarily called 'kabanina'. 'Kabanos' is derived from the name used to designate these hogs (Official Journal of the European Union No 1044/2011 (20.10.20011)).

3.1.2. 'Kiełbasa jałowcowa'

Registered by: Związek „Polskie Mięso”. Applicant does not apply for reservation of name according to 13.3 art. Of 509/2006 UE Regulation and does not ask for 13.3 art. of above Regulation.

Description of the product

'Kiełbasa Jałowcowa' (Juniper Sausage) has the outlook of wrinkled bar in a shape of wreath. The sausage has a shape circular bar without outside deep parallel folds. There are applied 2 magnitudes of sausages' wreath:

- -small natural casings with Ø above 32 mm and weight at about 0,5kg.
- -big in protein casings with Ø 36mm and weight at about 0,8kg.

The colour of 'Kiełbasa Jałowcowa' is dark brown, balanced on the whole surface, typical for strongly smoked product. Consistency and perception "in touch" are characterised by dry surface of wreath, regularly wrinkled and at the same time soft, the casings is tightly adhered to filling.

Specific flavour and tenderness flows from the raw material used, spices (esp. of juniper) and also from usage of natural smoking during production.

The microbiological and physico-chemical characteristics:

- protein content not less than 15,0%
- water content not more than 60,0%
- fat content not more than 35,0%
- salt (NaCl) content not more than 3,5%
- nitrates and nitrites content calculated as NaNO₂ not more than 0,0125%

Composed in such a way components allow for product traditional quality. The yield of ready to eat product has to be lower than 75 % (±3%) as compared to raw meat used. The meat used for production is pork and pork fat and there is also allowed to replace of pork meat with beef meat (<http://www.minrol.gov.pl/Jakosc-zywnosci/Produkty-regionalne-i-tradycyjne>)

Ingredients

Meat (100 kg of raw material): Class I pork with a fat content of up to 15 % — 20 kg, Class IIA pork with a fat content of up to 20 % — 50 kg, Class III pork with a fat content of up to 25 % — 20 kg, cutting fat — 10 kg. Up to 50 % of the Class IIA or Class III pork may be replaced by beef.

Seasonings (per 100 kg of meat): natural pepper — 0,17 kg, juniper — 0,12 kg, sugar — 0,20 kg. Other additives: curing mix (based on a mixture of table salt (NaCl) and sodium nitrite (NaNO₂)) — about 2 kg. Specific feeding refers to fatty-meat fattening. The aim is to produce pigs with a bodyweight of up to 120 kg, characterised by a higher intramuscular fat content (more than 3 %). The late – maturing breeds are appropriately fed with detailed conditions described in EU Regulation. **Stages in the production**

Stage 1 Preliminary cutting up of all meat ingredients. Ensuring that the pieces of meat are of a uniform size (about 5 cm in diameter).

Stage 2 Traditional curing (dry method) for about 48 hours, using a curing mix.

Stage 3 Mechanical processing: Class I meat is ground to around 20 mm in size, Class IIA meat to around 8 mm in size, and Class III meat to around 3 mm, and is then minced together with 5 kg of ice. Stage 4 Mixing of all meat ingredients and seasonings: natural pepper, sugar and juniper, which is ground just before it is added to the mixer. Stage 5 Stuffing into natural pig intestines of over 32 mm in diameter or protein casings 36 mm in diameter, twisting-off of sticks and shaping in garlands. Two types of casing can be used to make the sausages: smaller garlands in small pig intestines weighing 0,5 kg; larger garlands in protein casings weighing 0,8 kg. Stage 6 Settling at a temperature not exceeding 30 °C for two hours. Preliminary drying of the surface, ‘settling’ of the ingredients within the sticks. Stage 7 Drying of the surface, followed by traditional hot smoking (for about 120 minutes) and baking until a temperature of at least 70 °C is reached inside the sticks. Stage 8 Cooling for 24 hours. Stage 9 Cold smoking using beech chips and juniper branches (for 120 minutes approx.), followed by drying at a temperature of 14-18 °C for 3-5 days until a yield of 75 % (+/-3 %) is obtained. Specific character of the agricultural product or foodstuff (Article 3(3) of Commission Regulation (EC) No 1216/2007) of ‘Kiełbasa jałowcowa’ derives its specific character from several attributes that are typical of the product: tenderness and specific properties of the meat, exceptional taste and aroma, uniform shape (Official Journal of the European Union 2009/C 158/07 (11.7.2009)).

3.1.3. ‘Kiełbasa myśliwska’

Registered by: Związek „Polskie Mięso”. Applicant does not apply for reservation of name according to 13.3 art. Of 509/2006 UE Regulation and does not ask for 13.3 art. of above Regulation. Applicant does not apply for reservation of name according to 13.3 art. Of 509/2006 UE Regulation and does not ask for 13.3 art. of above Regulation.

Description of the product

‘Kiełbasa Myśliwska’ (Hunters’ Sausage) is short, dark brown. The shape are mostly two „in pair” falciform batteries (bars) with length at about 15 cm and diameter above 32mm, not cut in the place of curling of; the bars are evenly wrinkled on surface (without longitudinal hollows).

The surface colour of ‘Kiełbasa Myśliwska’ is dark brown. At the cut there can be seen dark red pieces of pork 1st class meat and light red pieces of 2nd class pork meat.

„The perception in touch” is characterised by smooth, dry and evenly wrinkled surface.

‘Kiełbasa Myśliwska’ is characterised by tender, brined, roasted and smoked meaty taste of pork meat with some spices addition. Aside the specific taste the sausage outstands for its tenderness.

The microbiological and physico-chemical characteristics:

- protein content not less than 17,0%
- water content not more than 55,0%
- fat content not more than 45,0%
- salt (NaCl) content not more than 4,5%
- nitrates and nitrites content calculated as NaNO₂ not more than 0,0125%

Composed in such a way components allow for product traditional quality. The yield of ready to eat product has to be lower than 68% as compared to raw meat used. The meat used for production is pork and pork fat and there is also allowed to replace of 50% 2nd class pork meat and/or 3rd class pork meat with beef meat (<http://www.minrol.gov.pl/Jakosc-zywnosci/Produkty-regionalne-i-tradycyjne>).

Ingredients

Meat: (100 kg of raw material): Class I pork with a fat content of up to 15 % — 30 kg,

Class IIA pork with a fat content of up to 20 % — 50 kg, Class III pork with a fat content of up to 25 % — 20 kg. Up to 50 % of the Class IIA pork or Class III pork may be replaced by beef.

Seasonings (per 100 kg of meat): natural pepper — 0,15 kg, juniper — 0,10 kg, fresh garlic — 0,10 kg, sugar — 0,20 kg.

Other additives: curing mix (on the basis of a mixture of table salt (NaCl) and sodium nitrite (NaNO₂)) — about 2 kg, tenderising mix (with the following composition: 1 litre of 10 % table vinegar, 1 litre of water, 1 litre of rapeseed or sunflower oil) — 3 litres. Specific feeding refers to fatty-meat fattening. The aim is to produce pigs with a bodyweight of up to 120 kg, characterised by a higher intramuscular fat content (more than 3 %). The late –maturing breeds are appropriately fed with detailed conditions described in EU Regulation. **Stages in the production**

Stage 1 Preliminary cutting up of all meat ingredients. Ensuring that the pieces of meat are of a uniform size (up to about 5 cm in diameter)

Stage 2 Traditional curing (dry method) for about 48 hours, using a curing mix.

Stage 3 Mechanical processing: Class I meat is reduced to around 20 mm in size, Class IIA meat to around 8 mm in size, and Class III meat to around 3 mm, and is then minced together with 2 kg of ice.

Stage 4 Addition of tenderising mix to Class I and Class IIA meat — thorough blending. Stage 5 Addition of minced Class III pork and seasonings — thorough blending. Stage 6 Stuffing into natural pig intestines of over 32 mm in diameter and twisting-off of sticks of about 15 cm in length. Stage 7 Settling at a temperature not exceeding 30 °C for two hours. Preliminary drying of the surface, ‘settling’ of the ingredients within the sticks. Stage 8 Drying of the surface and traditional smoking in hot smoke (for about 135 minutes) and baking until a temperature of at least 70 °C is reached inside the sticks. Stage 9 Chilling and refrigeration to below 10 °C. Stage 10 Drying at 14-18 °C and 70-80 % humidity for 5-7 days until the desired yield is obtained (not exceeding 68 %). Specific character of the agricultural product or foodstuff (Article 3(3) of Regulation (EC) No 1216/2007) of ‘kiełbasa myśliwska’ derives from several attributes that are typical of the product: tenderness, succulence and specific properties of the meat, exceptional taste and aroma, short, characteristic shape, exceptionally long shelf-life (Official Journal of the European Union 2009/C 160/07 (14.7.2009)).

3.2. Market research

There is almost no scientific nor popular evidence of market data concerning TSG products. The research of Rejman, Halicka, and Nagalska (2015) covers partial data concerning Warsaw market of traditional and regional products. The authors stated that there is almost no official control of this market, only the casual controls of IJHARS showed many cases of not proper competition. This situation also meets consumers lackage of knowledge in the area. The specific logos of EU are rather not known and rarely perceived at shops. The average consumers buys and eats the products rarely during special trades but still the prices are perceived as too high (Rejman, Halicka, and Nagalska 2015).

To find what the situation looks like at the Krakow's market we performed a short market research in shops and free open markets. The shops in Krakow can be divided into 3 groups – large malls (B; Bonarka, Galeria Krakowska, Galeria Kazimierz, Galeria Bronowice, Carrefour Tesco); medium size (M; Lewiatan, Tesco express, Kaufland, Lidl, Mila) small size (S)– free market small shops, small suburban shops, specially dedicated stores like 'Kredens Krakowski'. In all types of above shops, if only there exists meat and meat products stand, anyone can find kabanos, but not with TSG logo. Myśliwska and jałowcowa sausages are also present, without logo, rather in bigger shops.

The firm which produces kabanos with TSG logo and according to registered raw materials, recipe and technology is ZM OLEWNIK –BIS Sp. z o.o. Świerczynek 10a, 09-210 Drobin (Figure 3.1.). The original full name is: Kabanosy Stara Wędzarnia 350g Gwarantowana Tradycyjna Specjalność.



Figure 3.1. 'Kabanosy' (www.frisco.pl)

Stores in Poland, where we can buy a original product: Frisco(M), Stara wędzarnia(S), Auchan(M), Piotr i Paweł(M), Do domu(S). Almost any producer of meat products in Poland makes „own” kabanos: Tarczyński, Balcerzak, Pikok, Madej Wróbel, Sokołów, Morliny, Krakus, Henryk Kania etc. but there are used other meats than pork i.e. game meat, horse meat, beef meat and even poultry. The two other sausages are not so popular they are consumed by person who like typical spicy products with some extra scent from juniper. Both products are somewhat connected to forest and wilderness. Their characteristics (also kabanos) allow for long chilled storage because they are strongly dried. They are not so wide spread in shops as kabanos – mostly found in bigger shops (B and M).

The Juniper sausage 'kiełbasa jałowcowa' and Hunter sausage 'kiełbasa myśliwska' with TSG logo are also produced by ZM OLEWNIK –BIS Sp. z o.o. Świerczynek 10a, 09-210 Drobin (Figure 3.2.). The name of juniper sausage with TSG is OLEWNIK STARA WĘDZARNIA



Figure 3.2. (www.olewnik.com.pl)

The Juniper and Hunter sausages where we can buy a original product: Olewnik butcher shop, Kaufland, Auchan, small private stands. Some other shops selling these two types of sausages are: Rakon, Trzy Marchewki, Ecomania, Gajos, Zakrecony Sloik, Produktyregionalne.eu, NNowicki Naturalnie, Przystanek Dla Zdrowia, Eko Lud, Zdrowysklad, Ekolas, K&M Delikatesy, Gizewski, Swieze Mieso, Bio Smak, eBaccara, Egucio-Market Spozywczy, e-Szop, Litewskie Smaki (<http://www.twenga.pl>)

The price of 'Myśliwska sausage' ranges from 30 to 50 PLN/1kg and the price of Jałowcowa sausage from 28 to 50 PLN/1kg.

The consumption of these two sausages is not so frequent as kabanos, but all consumers who buy dry, specific products with long shelf life also buy these two types of sausages. The statistics revealed that consumption of meat products rose from 2,22 kg/person in 2005 to 2,32 kg/person in 2012 (4,5%); the consumption of high standard meat products rose about 22% (0,66 kg/person monthly in 2012). In the category of meat products 66% stands for low quality products (sausages and frakfurters), whereas 24% stands for high quality products (<http://www.portalspozywczy.pl/>).

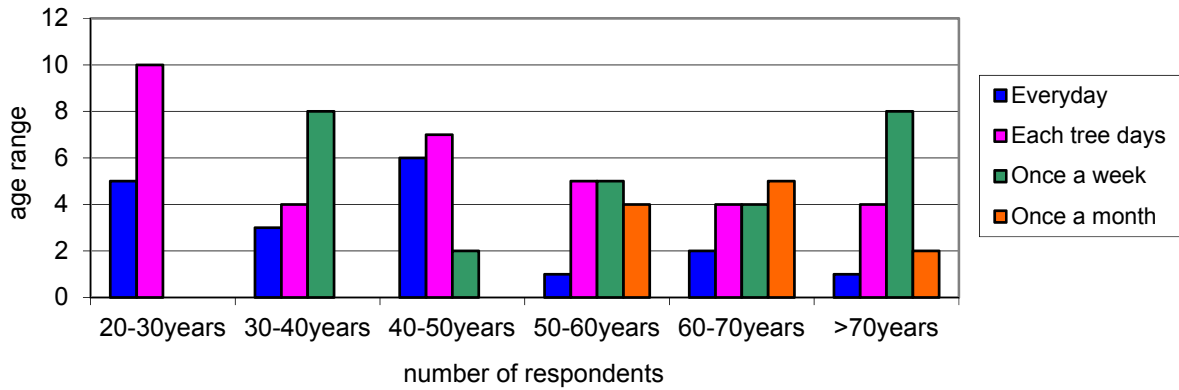
In Kraków anyone wanting to buy high quality meat products with any type of trade mark goes to "Kredens Krakowski" or to free market stands. There are a few free open markets (Jeżmanowskiego market, Stary Kleparz, Nowy Kleparz, Imbramowski, Hala Targowa, Balicka Giełda, Tomex) in the town where small (agro) producers can sell their products directly. The basic difference are the prices in "Kredens Krakowski" the prices start at least from 30 PLN per 1kg of product whereas in private, small stands regular sausage prices start from 20 PLN.

Direct market research

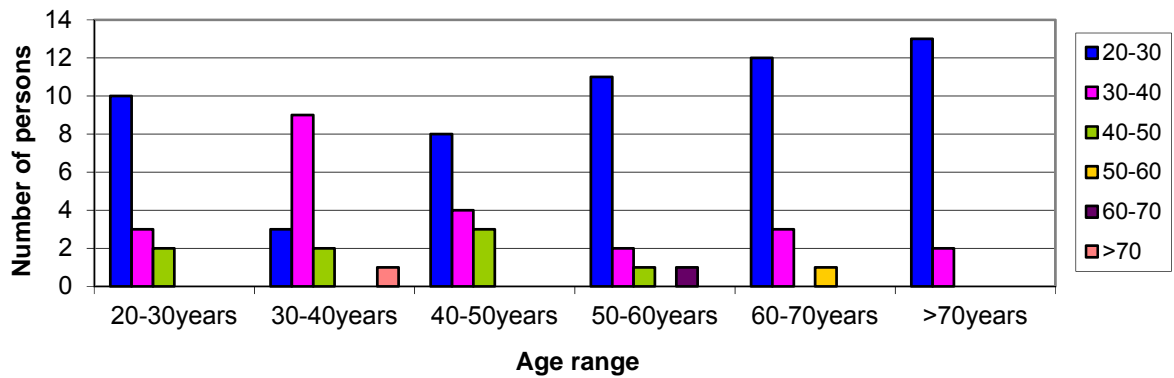
The research was performed at Krakow city shops (B,M,S)

The short questionnaire directed to consumers results are presented in figure 3.3. and figure 3.4. (the number of respondent was 15 persons in each age group)

Do you eat sausage?



Price you are willing to pay for outstanding quality sausage



Do you know presented quality signs?

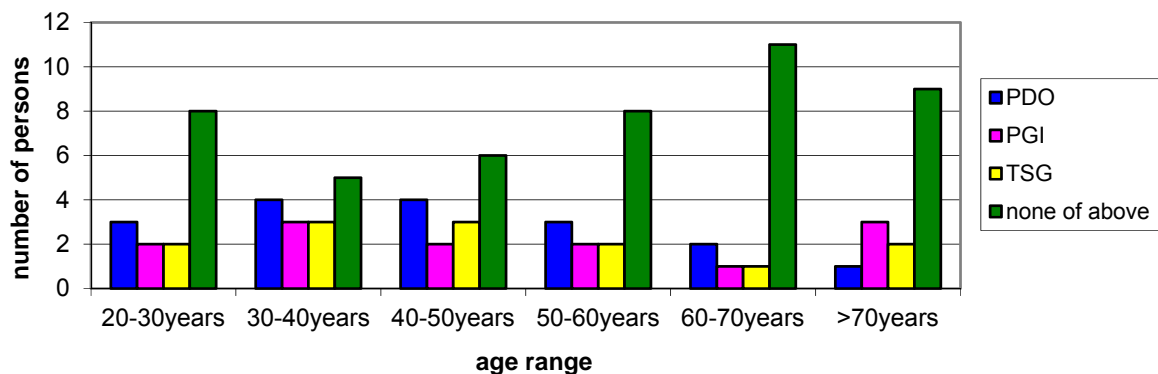


Figure 3.3. Market research

Do you recognise some specific Polish and/or foreign traditional products?

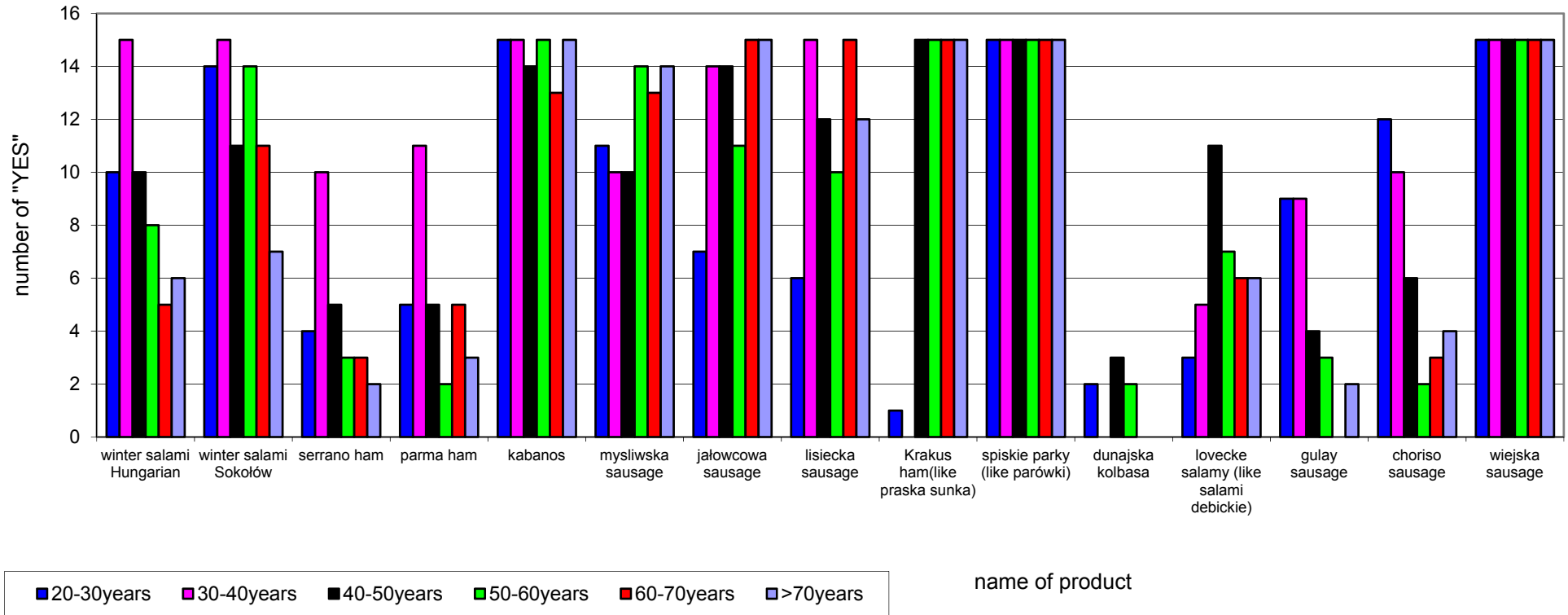


Figure 3.4. Specific and traditional product in market research

The main informing and advertising body can be also the shop assistants/shop owners for any type of traditional product, but there is still lacking knowledge and/or interest of giving advice to clients/consummers.

The number of big shops surveyed B=16 ; number of shop assistants BA = 56

The number of big shops surveyed M=14 ; number of shop assistants MA = 26

The number of big shops surveyed S=50 ; number of shop assistants SA = 50

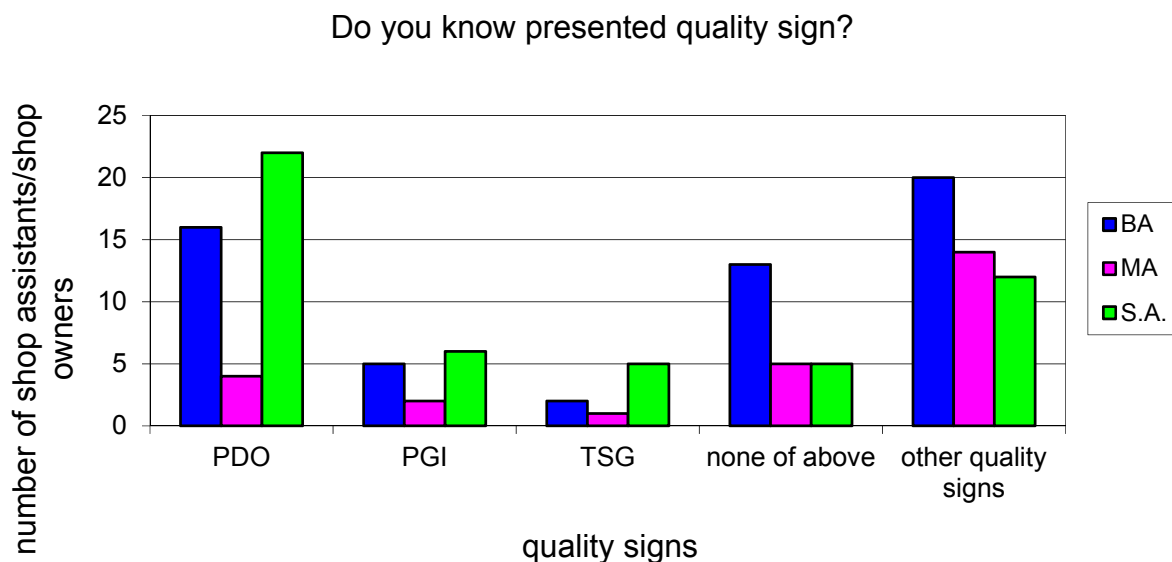


Figure 3.5. Quality sign

3.3. Information from inspection bodies

The Organs and individual units projected for control and certification of products with PDO, TGI, TSG in Poland:1. Minister of Agriculture (competent to agricultural markets), delegates certifying units to perform control, granting and taking back of certificates confirming the agreement of production process of products which possess Protected Destination of Origin, Protected Geographical Indication and /or Traditional Speciality Guaranteed, with the specification (application)2. The Main Inspector of market quality of agri-foodstuff articles (products) – performs surveillance on delegated by the Minister of Agriculture, certifying units

3. Regional (voivodship) Inspector of market quality of agri-foodstuff articles (products) performs the control of compatibility of the production process of agricultural products and foodstuffs which possess PDO, PGI and/or TSG with specification (application)

4. Delegated certifying units performing controls and issuing and/or taking back certificates of agreement

Minister of Agriculture and Rural Development delegated 5 private certifying units to perform, issuing and taking back of certificates confirming accordance with specified production process of agricultural products and foodstuffs which were granted PDO, PGI and TSG for the full range of certification. They are: •PNG Ltd., •Polskie Centrum Badań i Certyfikacji Ltd., •COBICO Ltd., •BIOCERT MALOPOLSKA LTD., •TUV Rheinland Polska Ltd 882/2004) is delegated to:

- Veterinary inspection
- State sanitary Inspection State Inspection of Plant and Seeds Protection Also for direct foodstuff control at a market place and searching/ securing food poisoning outbreaks are

created special local governmental units (in each voivodship) – Voivodship Stations of Sanitation and Epidemiology which are organs of State Sanitary Inspection.

This inspection bases on Regulation issued at 14th March 1985 with contemporary ammendments (Dz. U. z 2015 poz. 1412, with ammendments). This service was stated for realisation of tasks concerning public health area, especially for supervision of food health conditions, human nutrition conditions and human used products – conditions of production, transportation, storage and selling of foodstuff and of human consumption places condition. Also the unit cares for all types of places and buildings of human health and care (i.e. hospitals) and for keeping the rules of prophylaxis of hospitals threats outbreaks.

The units of State Sanitary Service control:

- food of not animal origin produced at country and launched to the market, imported/exported/ re -imported from third party countries (Animals and their products on this stage are controlled by State Veterinary Inspection)
- foodstuff of animal origin at all types of shops
- foodstuff containing both raw materials of animal and not animal origin (EU 853/2004) produced and launched to the own market and/or imported/exported to the third party countries which is not surveyed to EC 2007/275 according to Directive of European Council 91/496/ECE and 97/78/EU (Dz. Urz. UE L 116 z 04.05.2007,p.9)
- correctnes of HACCP system application at factories

The State Sanitary Service is under the authority of Minister of Health. At each level of control and leadership are delegated personally (from bottom to top) to: State County Sanitary Inspectors (318 persons), State Voivodship Sanitary Inspectors (16 persons) and State Borders Sanitary Inspectors (18 persons) and above them is General Sanitary Inspector.

This Inspectorial body is under the authority of Minister of Agriculture and Rural Development. The direct action is leaded by General Ispector of and at the level of voivodships 16 Voivodship Inspectors of

The area unit perform

1. surveillance on trade quality of agri-foodstuff, especially:

- control of trade quality of agri-foodstuff during production and at market; also those exported and imported (boarder control)
- assessment and certificates issue in area of quality of agri-foodstuff
- notification reporting to state contact point in the system of early warning of dangerous food and feeds (RASFF) about decision issued on dangerous agri-foodstuff
- control and protection of agri-foodstuff which posses registered names PDO, PGI and TGS and cooperation with foreign similar units

2. control of storage and transportation conditions of agri-foodstuff

3. Surveillance in area of trade quality described in EU directives concerning :poultry meat, eggs, pork carcasses, beef caarcasses, carcasses of other animals; of meat originating from beef younger then 12 months

4. Issue of certificates notifying the origin of beef meat (old beef) beeing in low to get importing refunds – special EU regulations

Trade Inspection

The specialised organ for control and protection of interests of consumers and of economical interest of state. The unit controls foodstuff and other trade stuff and services (Regulation 15th Dec 2000 concerning trade inspection and Regulation; On the basis of above the Trade Inspection controls trade quality of foodstuffs at retail market and also the control of legality and reliability of entrepreneurs actions.

The controls in the area of foodstuff are based on check if consumer offered stuff fullfills demands of trade quality, especially labelling. There is also the control of EU protected signs of origin controlled. As aside action of Trade Inspection there are consumer advising and mediations in arguments between consumers and producers. The control of agreement of the production process with the specification for products possessing PDO/PGI/TSG marks is performed on producers demand by the inspectors of field (voivodship area) specific for production place (Voivodship Inspectorate of Trade Quality) and/or delegated certyfing unit and the choice of the controlling body (PNG Ltd., Polskie Centrum Badań i Certyfikacji Ltd., COBICO Ltd.,BIOCERT MALOPOLSKA LTD., TUV Rheinland Polska Ltd)is on the producer's side.

The control aims in check if the product is produced according to specific demands. The control contains: the check of actual state at place, check of producer's supplied documents (register of individual production stages made by producer) and/or performing the inquiry with the producer to obtain indispensable information allowing foe estimation of actual state of thins. The scope timing and the kind of control depend on production specificity of the product (i.e. the number of stages of production, the levels of processing) and should be discribed in the applicant for certiification documents.

For PDO and PGI there are controlled, especially, the elements connecting the product to the region. The TSG are controlled especially for those stages of production which influence on the product' s specific character. The costs of control are callculated on state regulation basis and paid by the producer. Only properly performed control and conclusion of accordance of the product with registered specification allows for usage of EU registered logo.

Below are cited the demands (after EU regulation) concerning Polish TSG sausages.

Minimum requirements and procedures to check the specific character (Article 4 of Regulation (EC) No 1216/2007):

Frequency of control:

Control on the above-mentioned stages must be carried out once every two months. If all these stages are functioning correctly, the frequency of the checks may be reduced to two per year. If irregularities occur at any stage, the frequency of checks on that stage must be increased (to once every two months). Checks on other stages may continue to be carried out once every six months.

4. Authorities or bodies verifying compliance with the product specification: Główny Inspektorat Jakości Handlowej Artykułów Rolno-Spożywczych ul. Wspólna 30, 00-930 Warszawa POLSKA/POLAND

With regard to the specific character of meat TSG, the following in particular should be subjected to checks:

1. Quality of raw materials used in production (pork, seasonings), including technological suitability of the meat, type of fattening, curing time, seasonings used in the production and the proportions in which they are used.

2. Smoking process In the course of an inspection, the following must be checked: maintenance of the temperature required for traditional smoking in hot smoke and the heating temperature, maintenance of the duration and temperature of repeat smoking in cold smoke, use of beech chips for smoking in cold smoke.

3. Quality of the finished product: protein content, water content, fat content, sodium chloride content, nitrate (III) and nitrate (V) content, taste and aroma.4. Shape of the product.

3.4.Introduction of university

University of Agriculture in Krakow derives its experience from intellectual heritage and tradition of the Jagiellonian University. At this very University agronomical and forestry sciences developed since

1890 and young people were educated with particular regard to their patriotic upbringing. From the moment when the Study of Agronomy was founded at the Jagiellonian University, agriculture has been permanently taught at the university level. Over the whole history of these studies the subsequent generations of professors followed a common guiding principle, i.e. bringing up young people in reverence for civil liberties and ethic rules. For such attitude the members of academic staff often suffered repressive measures and some were even deprived of the right to teach.

Today, after sixty years of the University functioning as an independent institution we still recognise the independence of ideas and attitudes as well as protection of commonly accepted academic rules and values as our priorities.

Current educational offer comprises 45 main fields with 45 specializations, there are about 13 thousand students enrolled at all types of studies. The University offers also 32 postgraduate programmes for Master Diploma holders

The main objective of the University of Agriculture in Krakow as the institution of higher education is educating experts who would find employment in the widely understood food and forest economies and specialists in environmental protection. The University aims to prepare professionals able to meet the challenges of contemporary sustainable development based on ecological rules of management and utilisation of the Earth resources.

Anticipating the future trends of economy development the University provides modern knowledge and skills in agricultural sciences, in forestry, in biological and economic sciences and engineering. Socio-economic changes which occurred in Poland caused that a new type of qualifications are now expected from the University of Agriculture graduate. In place of a professional prepared to supervise production processes in agriculture, a specialist able to combine his technological expertise with advisory skills and proper economic knowledge is required. The University of Agriculture graduate, highly proficient in his knowledge and communication skills should be properly prepared to work in the areas of widely understood services for agriculture. A growing number of specialists in the EU countries has such profile of professional qualifications. It is due to the fact that beside food manufacturing also concern for its quality, control and sales becomes most important. In this area advisory services at different levels play a vital role.

In order to provide the graduates with skills which would meet the expectations and needs of future labour market, information technologies are implemented as part of curricula in all fields of studies. Also internships realised both outside our University and in its experimental units are changing their character in view of introduced modifications. All members of the academic staff are obliged to do their best to maintain a high quality of teaching.

Research constitutes an inseparable part of the University activities. Two main areas may be distinguished, i.e. research projects realised as grants and the European Union programmes where the objectives are determined the author of a project or by contracting agency. The other comprises projects implemented as the statutory activities. These projects are strictly connected with a widely understood didactic process and support it. Participation in extensive research programmes also international ones and adopting information technologies to assist the development of agriculture should build up the importance and strengthen the University identity both in Poland and abroad.

Today in University of Agriculture in Krakow (al. A. Mickiewicza, Kraków, Poland) there are functioning subsequent faculties:

- Faculty of Agriculture and Economics
- Faculty of Forestry
- Faculty of Animal Sciences
- Faculty of Environmental Engineering and Land Surveying
- Faculty of Biotechnology and Horticulture
- Faculty of Food Technology

3.5. Material and methods used as part of the project

The research concerning the TSG products was performed at the Faculty of Food Technology, Department of Animal Product Technology and Department of Gastronomic Technology and Consumption, ul. Balicka 122 Kraków, Poland.

As part of project was instrumental analysis of total protein level of all TSG product from V4 partner countries.

Protein content in all TSG samples was performed by Dumas method (PN –EN ISO 16634-1:2008 – Food products. Estimation of total content of nitrogen by Dumas by burning and calculation of protein level with specif for each product coefficients)

Experimental routine: Average sample of products weighing 0,5g were placed in tin folia films, sealed and loaded to sampling head of Leco apparatus (Figure 3.6.). The sample was burnt at 950 °C, in oxygen, then the products were directed to second oven (850 °C) where were finally combusted – oxygenated and cleared from greaser particles. The gases originating from combusting caught in balast tank were homogenised and mixed to helium. The mixture of gases was then leaded through catalyst oven with hot copper to reduce Nox to N2 then through beds with Leosorb and Anhydrone to clarify from CO₂ and water. The clarified gas mixture flowed through thermocouple detector to measure the amount of nitrogen. The amount of nitrogen measured was then used to calculate the total protein content [g/100g] in sample by multiplying on 6.25.



Figure 3.6. Truspec N apparatus Leco (<http://www.leco.pl>)

3.6. Results and discussion of products from Polish market

There were assessed 3 types of Polish meat TSG

1. Myśliwska sausage – there were chosen 2 producers of these sausages present on Krakow's market i.e.
 - a/ big producer - Myśliwska "Krakus" (Animex Morliny)
 - b/ small producer - Mysliwska „Jano” (J. Serwatka)
2. Jałowcowa sausage – because of typical composition for this TSG only one type of sausage found in Krakow's shops was included into experiment (raw material –pork meat only)
 - a/ Jałowcowa "Jano" (J. Serwatka)
3. Kabanosy – there were chosen 2 producers of these sausages present on Krakow's market i.e.
 - a/ big producer - Kabanosy "Krakus" (Animex Morliny)
 - b/ small producer - Kabanosy "Tomasik" (G. Tomasik)

The results for chemical composition of Polish TSG products – sausages are presented in Table 3.1.

Table 3.1. Chemical composition of Polisch products

Sausage	Water content [%]	Dry matter content [%]	Protein content [%]	Fat content [%]	Salt content [%]	MSM [%]	Hydro-colloids [%]	Starch [%]
TSG standard Myśliwska	<55	>45	> 17	<45	<4,5	No	No	No
Myśliwska „Jano”	42,20±0,38	57,81±0,38	18,82±1,06	33,61±1,31	2,16±0,00	0,17±0,03	Negative	Negative
Myśliwska “Krakus”	54,05±0,16	45,95±0,16	23,28±0,13	17,61±0,18	2,72±0,00	0,14±0,01	Negative	Negative
TSG standard Jałowcowa	<60	>40	>15	<35	<3,5	No	No	No
Jałowcowa „Jano”	45,19±0,11	54,82±0,11	17,02±0,90	33,89±0,01	2,17±0,00	0,24±0,07	Dubious	Negative
TSG standard kabanosy	<60	>40	>15	<35	<3,5	No	No	No
Kabanosy „Jano”	25,00±0,02	75,00±0,02	27,65±0,25	39,01±0,58	2,95±0,00	0,15±0,06	Negative	Negative
Kabanosy „Tomasik”	33,72±0,01	66,28±0,01	19,45±0,10	42,58±0,04	1,62±0,00	0,00±0,00	No	No

All assessed products had slight inconsistencies according to the EU Regulation for TSG products, but anyhow they did not possess the guaranteed logo. The closest to the rules was Kabanosy sausages produced by “Tomasik” and what is more important the producer itself is the smallest of all examined. All the parameters for “Tomasik” kabanosy were in accordance but fat content was not. Also important is the low level of salt content in the light of contemporary dietetic demands, and besides of that the organoleptic score for these sausages was good (see Ch.6). The rest of products were containing MSM meat which is not allowed for TSG products and this way their producers can not apply for the logo. Big firms frequently use similar names for their products as reserved ones to “steal” the market share taking into account the consumers' tendency to buy cheaper products with the same characteristics. But in this case the characteristics promised by name were not in agreement with demands, but ordinary consumers pay rather less attention on slight discrepancies but money. The smart advice in this area would be necessary and to think about for future, because as the results obtained for sellers' product knowledge there is a large lackage (see Chapter 3.2.).

The direct conclusion is obvious – the quality of product is the main and sometimes only support for small entrepreneurs to survive on contemporary market.

Also the frequency of official check on TSG products and products using similar names should be intensified. Although it is said that the market itself regulates the quality but still we have to look upon the honest competition and consumers' safety aspects.

4. Traditional Specialities Guaranteed in Slovak Republic

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4.1. Description of the Slovak TSG products

Part A: Meat products

The Slovak Republic has four meat products registered as a traditional specialty guaranteed: 'Spišské párky'; 'Špekáčky'; 'Liptovská saláma' and 'Lovecká saláma'. These meat products are registered as a traditional specialty guaranteed also in The Czech Republic.

4.2. 'Spišské párky'

Description of the product

'Spišské párky' are registered with name reservation in the Register of traditional specialties guaranteed since 2011 (Commission Regulation (EU) no. 159/2011). The name 'Spišské párky' is specific in itself, because it is well-established and well-known in both Slovakia and the Czech Republic, has a long tradition and a good reputation and relates to 'párky' of a particular type.

The specific character of 'Spišské párky' derives from the composition and proportions of the ingredients and seasonings used, the smoothness of the homogeneous mass, the use of sheep-intestine casings and their physical and chemical and organoleptic properties.

'Spišské párky' figure 4.1. are contained in sheep-intestine casings of up to 24 mm in diameter and are separated by twisting. The individual sausages weigh about 50 g. Surface of product is smooth or slightly wrinkled, orange-brown in colour and glossy to matt. Cut surface is pinkish red, owing to paprika and small collagen particles are permitted. Product has pleasant freshly-smoked aroma. Taste is slightly hot, appropriately salty and succulent to the bite when heated up. Consistency is soft to compact.



Figure 4.1. 'Spišské párky' (<http://www.svaman.sk/>)

This product must meet the following chemical properties: fat content - max. 24 % \pm 4 %, salt content - max. 2 % \pm 0,4 % and net muscle protein content at least 10 % by weight.

Historical background

The production of 'Spišské párky' goes back more than a century in Slovakia. It was first recorded when a local butcher in Spišské Podhradie, Štefan Varsányi, took advantage of the frequent visits of the Hungarian nobility to the grand fairs held by Spiš Castle. He began selling 'Spišské párky' at those fairs as a special attraction. His recipe, based on a delicate mix of seasonings with sweet and hot paprika, was clearly very successful, for after a while he was selling them in Hungary and Poland as well.

Exports of 'Spišské párky' were facilitated by, among other things, the building of the Košice-Bohumín railway and its branch line to Spišské Vlchy and Spišské Podhradie. Early in the morning,

sausages were packed in special boxes and put onto the first morning train from Spišské Podhradie, and at noon they were ready to be savoured by the gourmets of Budapest.

Indeed, the well-known Slovak writer Emo Bohúň also commented from experience: ‘Spišské párky were troublesome and tricky blighters and often misbehaved. They couldn’t be eaten with a knife and fork, or be broken open like other, similar kinds of sausage [viršle]. You had to take them between your fingers, stuff them into your mouth, get your lips right round them and only then bite. They held lots of paprika-infused juices within their swollen skins, and if we had broken or cut them open or stuck a fork into them, those red juices would have shot a hundred metres into the air in all directions. They could have come in quite useful for firemen, instead of their hoses or fire extinguishers’.

Apart from Štefan Varsányi, producers of ‘Spišské párky’ up to 1938 included Grieger and Blaško in Spišské Podhradie, Slavkovský in Spišské Vlachy, and Schretter, Schmiedt, Patrilla and Lešňák in Levoča. In Spišské Podhradie in the 1940s, ‘pig markets’ of some renown were held on Thursdays, when it was the custom, if buying and selling had been good, for traders and buyers to gather round tables in taverns, which were owned by butchers who made smoked meats, and order ‘viršle’, as ‘Spišské párky’ were known in those days. They were sold at every railway station. As soon as a train stopped, someone would cry out at the top of their voice, ‘Spišské páááááááááárky, viršle, viršličky...!’.

‘Spišské párky’ have a good name not only in the Spiš region, Slovakia as a whole and the Czech Republic, but also in other countries. Among those who regularly enjoyed them were President T.G. Masaryk and Count Albín Csáky, who was speaker of the upper house of the Hungarian Parliament and Minister for Education and Culture. This influential man made sure that these sausages were served at Hungarian cabinet meetings. ‘Spišské párky’ were, and are still, also available in Czech pubs. They were an integral part of Labour Day celebrations and various fairs such as the Folk Crafts Fair (Trh ľudových remesiel) in Spišská Nová Ves, at which, apart from ‘Spišské párky’, a virtually forgotten, but ingenious receptacle for serving them was presented. This receptacle is made of earthenware and has a double bottom for boiling water so that the sausages can be kept hot for longer.

After the Second World War, a standard was adopted throughout the Czechoslovak Republic, in the context of standardisation and maintenance of traditional quality, establishing the composition of the ingredients and defining the production method (Quality standard TP of 8 September 1954, Ministry of the Food Industry).

It is clear from historical records that the product recipe gradually changed somewhat, with the addition of a proportion of beef to the recipe; this did not change the nature or use of the product — on the contrary, this combination of ingredients improved its flavour (ÚNK 57 7260, 1964).

The product's defining characteristic features are its succulence after being cooked and the mildly piquant taste that the paprika imparts. This recipe is still used by producers of ‘Spišské párky’ today (CSN 57 71 34, dating from 1977, and later STN 57 71 34).

Processing technology

The ingredients used to produce ‘Spišské párky’ are following:

➤ beef with a fat content of up to 10 %	21.20 %
➤ pork with a fat content of up to 10 %	21.00 %
➤ pork with a fat content of up to 50 %	38.00 %
➤ pork rind	12.00 %
➤ potable water	21.00 %
➤ nitrite salting mix	2.10 %
➤ ground sweet paprika (100 ASTA)	0.62 %
➤ ground hot paprika	0.62 %
➤ polyphosphates (E 450 and E 451)	0.30 %
➤ ascorbic acid (E 300)	0.05 %
➤ casing — sheep intestines	

The beef and pork are first pre-cut and then finely minced in a mincer or chopped up finely in a cutting machine. The pork rind is added and the ingredients are worked into a smooth homogeneous mass. A mixture of ground sweet paprika and ground hot paprika and nitrite salting mix, including the additives (polyphosphates E 450 and E 451 and ascorbic acid E 300), is then added. This mixture is fed into sheep intestines of up to 24 mm in diameter. The individual sausages are separated by twisting so that each link weighs about 50 g. The finished products are hung, in a continuous string, on sticks which are placed in a smoke-room, where the products are dried and smoked. They are smoked in hot smoke at up to 68 °C for no longer than 45 minutes. The smoked products are then cooked at a temperature of 71-76 °C until the middle of the product reaches a temperature of 70 °C. This temperature must be maintained in the middle of the product for at least 10 minutes. After cooking, the products are sprinkled with cold water and left to cool slowly until the temperature in the middle is no more than + 4 °C.

4.3. 'Liptovská saláma'

Description of the product

'Liptovská saláma' is registered with name reservation in the Register of traditional specialties guaranteed since 2011 (Commission Regulation (EU) no. 161/2011). The name 'Liptovská saláma' is specific in itself because it relates to a particular type of salami. In Slovakia and the Czech Republic it is well established and well known, and has a long tradition and a good reputation. Its manufacture has long conformed to national standards.

The characteristic features of 'Liptovská saláma' figure 4.2. are its homogeneous appearance when cut, its delicate meaty taste and the aroma imparted by the spices used and the smoking process. This meat product has cylindrical shape with a diameter of 8 – 9 cm and is long approximately 35 – 50 cm (the mini product is approximately 5 cm in diameter and 15 – 20 cm in length). Product is elastic to the touch.

The external appearance of this product is smooth or slightly wrinkled. The colour of the casing used is light or dark brown, and spots of dried juice and smoking-process stains on the casing are permitted. The cut surface is meaty-pink in colour and the presence of soft collagen particles in the homogeneous mass is permitted. Natural spice particles are visible. Mild aroma of spices (especially of mace, nutmeg and ginger) and smoking is typical for this product. Taste of 'Liptovská saláma' is appropriately salty and spicy and its consistency is elastic and compact.



Figure 4.2. 'Liptovská saláma'

This product must meet the following chemical properties: fat content - max. 40 %, salt content - max. 2.1 % ± 0.6 % and net muscle protein content at least 8 % by weight.

Historical background

In 1956, workers at the meat-producing plant at Dubnica nad Váhom attempted to make a product different from the finely ground cooked meat products produced at the time. They replaced

some of the pork fat with pork offcuts, the product was processed to a fine texture rather than the coarse texture that was normal at the time, and the result was 'Liptovská saláma'. At that time they did not add paprika, and that is how the name 'Liptovská saláma' came about, because in the Liptov region it was not customary to add paprika to meat products. The product became very popular.

At the start of the 1970s the unique recipe for 'Liptovská saláma' was created at this research department, and the product went on to find great favour. It was gradually put into production at many meat processing enterprises. Industry standard ON 57 6913 was adopted in 1978. This standard has been regularly updated and revised (Appendix, 13 August 1982). One of the most recently renewed joint standards is the THN (technical-economic standard) for product number 764421 64, produced on 1 September 1988. The introduction to this standard includes the following note: 'Conforms to ON 57 6913'. In 1978 the Západoslovenský mäsový priemysel (Western Slovakia Meat Industry) works at Trnava began producing 'Liptovská saláma' in cooperation with the research department of the GRT. Until 1990 we produced 'Liptovská saláma' according to the traditional recipe and did not use paprika. 'Liptovská saláma' allowed pork fat to be processed to an increased level, and around 600 kg was produced at the Trnava factory daily. It was very popular among consumers because of its distinctive taste.

Processing technology

The ingredients used to produce 'Liptovská saláma' are following:

➤ beef with a fat content of up to 10 %	19.10 %
➤ beef with a fat content of up to 30 %	6.70 %
➤ pork with a fat content of up to 10 %	19.00 %
➤ pork offcuts with a fat content of up to 50 %	23.30 %
➤ pork fat	23.40 %
➤ potable water or ice	16.00 %
➤ nitrite salting mix	2.00 %
➤ ground black pepper	0.19 %
➤ ground nutmeg	0.02 %
➤ mace	0.02 %
➤ ground ginger	0.02 %
➤ garlic (flakes, concentrate, powder)	0.06 %
➤ polyphosphates (E 450 and E 451)	0.30 %
➤ ascorbic acid (E 300)	0.05 %
➤ casings — smokeable cellulose casings	

A fine homogeneous mass is prepared from all the raw materials, additives, spices and garlic and processing aids. The mixture thus prepared is fed into casings 8 – 9 cm in diameter and approximately 35 – 50 cm long. The products are hung on rods which are placed in a smoke-room, where they are dried and smoked using warm smoke, for the purposes of imparting a characteristic colour and aroma to the product. The smoked products are then cooked through at a temperature of 75 – 78 °C until a minimum heat effect corresponding to a temperature of 70 °C is reached in the core of the product for a period of at least 10 minutes. After cooking through, the products are sprinkled with cold water and allowed to cool. 'Liptovská saláma' is placed on the market in a casing or in vacuum or controlled-atmosphere packs. As a cut product it is placed on the market in vacuum or controlled-atmosphere packs of various weights.

'Špekáčky' and 'Lovecká saláma' are described in the chapter Traditional specialities guaranteed of The Czech Republic

Part B: Milk products

Dairy products made from sheep milk in Slovak republic have their long tradition. History of making sheep lump cheeses in Slovak republic is based on traditional sheep farming, when sheep provide humans benefits not only in the form of milk, but also in wool or meat. The Slovak Republic has two milk products registered as a traditional specialty guaranteed: 'Ovčí hrudkový syr-salašnícky' and 'Ovčí salašnícky údený syr'.

'Ovčí hrudkový syr-salašnícky' is registered without the name reservation in the Register of traditional specialties guaranteed since 2010 (Commission Regulation (EU) No. 984/2010). And 'Ovčí salašnícky údený syr' is registered without the name reservation since 2010 (Commission Regulation (EU) No. 930/2010). But, on 14th april 2016 was submitted Application for approval of an amendment in accordance with the first subparagraph of Article 53(2) of Regulation (EU) No 1151/2012. This application was submitted because the registration of traditional speciality guaranteed without reservation of the name should be replaced by registration of traditional speciality guaranteed with reservation of the name.

Description of the products

'Ovčí hrudkový syr – salašnícky' is a cheese which is produced from fresh sheep's milk in shepherd's huts and derives its characteristic taste as a result of the traditional technology used during its fermentation, and of being shaped by hand into a lump. The specific character is determined by the nature of the raw materials, i.e. raw sheep's milk and the traditional processing thereof in shepherd's huts. The term 'salašnícky' in the name expresses the product's specific nature and is derived from the word 'salaš', denoting a shepherd's hut, where the cheese is made, and hence also expresses a link to the place of production.

Physical properties are spherical shape, in the form of a lump with weight up to 5 kg. Chemical properties are dry matter at least 40 % by weight, fat content by weight in dry matter at least 50 % and acidity (pH) 5,2-4,9. Microbiological criteria contains a range of microorganisms, including in particular Acidogenic microorganisms - Streptococcus lactis, Leuconostoc mesenteroides, Lactobacillus casei, Lactobacillus plantarum; yeasts and moulds - Torulopsis candida, Geotrichum candidum, Geotrichum casei. Organoleptic characteristics of sheep lump cheese not smoked are following: external appearance should be dry, intact, unblemished surface, slight crust in cross-section, with smallish holes and small cracks here and there. Colour should be from white to yellowish on the surface, white with a slight yellow tinge in cross-section. Taste and smell should be mild, slightly acidic, clean taste, typical of sheep's milk products. Consistency of sheep lump cheese should be firm and elastic.

'Ovčí salašnícky údený syr' is produced from fresh sheep's milk, processed in shepherd's huts, smoked and often formed into specific shapes (hearts, cockerels or other animals, hemispheres). The specific character is determined by the nature of the raw materials, i.e. raw sheep's milk, the traditional method of processing in shepherd's huts and by smoking. The term 'salašnícky' in the name expresses the product's specific nature and is derived from the word 'salaš', denoting a shepherd's hut, where the cheese is made, and hence also expresses a link to the place of production. Physical properties of smoked sheep lump cheese are following: it comes in various shapes, most often a lump, or if a mould was used in production, in the shape of the mould: hemispherical, or in the shape of different animals or in the shape of a heart, with weight, which varies from 0,1 kg to 1 kg. Chemical properties are dry matter at least 40 % by weight, fat content by weight in dry matter at least 50 %, and NaCl: max. 25 000 mg/kg. Microbiological criteria contains a range of microorganisms, including in particular Acidogenic microorganisms — Streptococcus lactis, Leuconostoc mesenteroides, Lactobacillus casei, Lactobacillus plantarum, yeasts and moulds — Torulopsis candida, Geotrichum candidum, Geotrichum casei. Organoleptic characteristics of smoked sheep lump cheese are: external appearance dry, firm, intact surface, with a crust, possibly also with small smoke stains, free of tar residue. Colour should be yellowish to yellow in cross-section; brownish to slightly chestnut on the surface. Odour and taste

should be smoky aroma, with a mild, slightly acidic taste. And consistency should be firm and solid when cut, with small holes and small cracks here and there. It is generally opinion, that the characteristic taste, flavor and texture of different cheeses is a result of the presence of natural microflora, and as a result of traditional biotechnological production process (Laurenčík et al., 2008).

Historical background

Sheep farming was one of the basic forms of agricultural production since ancient times. The importance of sheep farming in Slovakia increased in the 16th and 17th centuries after the Wallachian colonization law, when were first elements of sheep farming brought here from east Carpathians. (Zuzskinová, 1999). There are frequently references about sheep farming from old historical records, but there are many facts about direct purpose of sheep's as dairy animals and for making sheep lump cheeses. Since Roman times was region around Kežmarok marked as advanced for sheep farming and probably for cheese making. From 1151 year exists findings about shepherd's hut – lat. ovilae and about shepherds as a national minority population mainly dealing with sheep grazing. In that times, they were called 'pasekári', 'Wolosi'. The live semi nomadic way scattered over pastures, especially on margins of forests.

Some historians put in relation name of Kežmarok, in lat. Called 'Forum caseorum', which translated means 'market for cheese', with places where sheep cheeses were sell off. But direct evidence of what type of cheese was self off there does not exist (Mikuš, Plánovský, Semjan, Švec, 1967).

Sheep has always played a significant role in our economic history. Until the second half of the 19th century was sheep source meat, milk and meat and milk products, the mainly source of daily livelihood. Sheep provide products that were the only one's market article of the peasant (Keresteš, 2008). Sheep belonged in ancient Slavs to the most benefit animal. Extensive philological exploration confirms that shepherd's terminology before The Hungarian Slavs was rich and is not unequivocal manifestation of reproduced Romanian Wallachian shepherd's colonization period, as reported earlier source (Gajdošík a Polách, 1988). Sheep's milk has always been an important part of the daily diet of the population.

The 'salašnícky' element of the cheese's name is derived from the traditional production site, which was a shepherd's hut (salaš). Its traditional character stems from its traditional composition, production method and processing. As P. Huba stated in the book entitled Zázrivá, 'Small-scale highland sheep-farming in Zázrivá was focused on the production of sheep's milk, which was always processed in the shepherd's home (salaš), where 'ovčí hrudkový syr – salašnícky' was offered as a delicacy to people visiting the shepherd' (Martin: Osveta. 1988). In the 20th century, the production of 'Ovčí hrudkový syr – salašnícky' and 'ovčí salašnícky údený syr' spread throughout the mountainous areas of Slovakia where sheep were reared. 'Ovčí hrudkový syr – salašnícky' and 'ovčí salašnícky údený syr' are amongst the dairy products of traditional Wallachian sheep-farming, the production of which was the main reason for rearing sheep in the mountainous regions of Slovakia. As a culinary speciality, it was used fresh (succulent-sweet) or fermented or dried, or preserved by smoking (Podolák Ján: Slovenský národopis 25, 1977) (Application for registration of a TSG, Official Journal of European Union, 2010).

Processing technology

Collection of sheep's milk. Milk to produce the cheese is obtained from healthy sheep (sheep of races reared in mountain and foothill areas) by hand-milking in a milking pen ('strung') figure 4.3. located in natural conditions.



Figure 4.3. Milking pen ('strung') (Doc. MVDr. Pavel Maľa, PhD., 2005)

The milk is collected in a rust-proof milking pail fitted with a filtering device (traditionally the milk was collected in a wooden pail). When the pail ('geleta') is full, its contents are strained into a milk can through a sieve containing a cotton-wool filter (the milk may also be collected mechanically in a mobile or stationary milking parlour). The milk collected is transferred in the cans to the production premises - a shepherd's hut ('salaš-koliba'). Modern way of collecting sheeps milk is in sheep milking parlours with milking machine used (Figure 4.4).



Figure 4.4. Sheep milking parlour (Doc. MVDr. Pavel Maľa, PhD., 2005)

Processing the milk into cheese - production of sheep's milk lump cheese. The freshly collected milk is processed immediately after milking, after being transferred to the production area of the shepherd's hut, where it is poured from the can into a putera, a vessel used for cheese production; during this process, it is refiltered through a cotton-wool filter. A wooden vessel (putera) or a stainless-steel double-bottomed vessel is used to produce the cheese. The temperature of the milk is raised to 30-32 °C by adding hot drinking water (at a temperature of 50 °C) directly to the milk or by heating it with the aid of hot water in a jacketed vessel or putera, or by adding boiled sour sheep's milk whey. After the temperature has been raised to 30-32 °C, microbial liquid rennet (based on the salt stabilised fungus *Rhizomucor miehei*) is added, accompanied by continuous stirring, at a quantity of 40 ml of rennet per 100 l of milk (the amount of rennet is determined by the producer on the basis of its strength). The amount of rennet used also depends on the milking period (i.e. the quality of the milk,

which changes during the milking period). The milk curdles approximately 30- 45 minutes after the rennet is added. The curds thus produced are stirred and cut with a curd-harp until a grain size of 0,5- 1 cm is obtained. Boiled drinking water, cooled to 65 °C, is added to the cut curds in order to heat them to 32-35 °C, thus improving the release of whey from the curd grains. The curds are stirred well and left to rest. Throughout the production of the sheep's milk lump cheese, the temperature of the milk and whey must not fall below 29 °C. The settled curds are compressed by hand after about 10 minutes and worked into a lump with the aid of a cheesecloth. The lump is left to drain for about two hours, hanging on a hook. After draining, the cheese is transferred to a warm storage area - the ripening room - where the fermentation process takes place. Cheese shaped in a cheesecloth is hung on a hook and later placed on a shelf that is designed in such a way as to allow whey to drain off. The temperature of the room during fermentation must not fall below 18-22 °C. The cheese ferments in two or, at most, three days under such conditions. The temperature during fermentation is monitored. When the production process is complete, the cheese may be sold. When sold, the cheese is packaged and labelled.

Cheese making process of 'Ovčí salašnícky údený syr' is the same as 'Ovčí hrudkový syr-salašnícky' up to the process of fermentation at 18-22°C for 2-3 days. Subsequently, lumps of cheese are then cut into pieces and placed in a cold brine solution for 1-10 hours (depending on their weight). Once salted, the cheese takes on a solid and firm consistency. The brine solution (10-15 % salt concentration) is prepared by boiling drinking water with salt. Cheese shaped in moulds is salted in a similar manner. After salting, the cheese is removed from the solution and placed on wooden shelves to dry and to drain off residual brine solution (Figure 4.5.). This is followed by smoking: the cheese is placed on wooden or stainless steel grids (or hung on holders made from bast) and cold-smoked with hardwood smoke which must not contain ash or dust. The cheese is smoked until it is pale brown with a hint of light chestnut colour, which takes 12, 16 or as much as 24 hours. Once smoked, the cheese is placed on wooden shelves in a cold store-room where the temperature is 13-15 °C. Once smoked, the cheese is placed on wooden shelves in a cold store-room where the temperature is 13-15 °C.



Figure 4.5. Sheep lump cheeses on wooden shelves (Doc. MVDr. Pavel Maľa, PhD., 2005)

4.4. Market research

Within the project we carried out market research to determine which Traditional specialities guaranteed are predominant in Slovak shops. We found that from the meat products ('Spišské párky', 'Liptovská saláma', 'Špekáčky' and 'Lovecká saláma'),

Slovak republic has 20 registered producers which can produce TSG 'Spišské párky'. Therefore this product is dominated in Slovak markets (41.8 %). All of them were produced by Slovak producers. This meat product is registered with name reservation and therefore can be produced only as TSG. All 'Spišské párky' were marked as a TSG.

'Špekáčky' were represented by 30.2 %. This product is registered as TSG without name reservation and we have just 3 registered producers which produce this product as TSG. Just 23 % of 'Špekáčky' were marked by TSG logo. 84.6 % of 'Špekáčky' was produced by Slovak producers and other was produced in Czech Republic.

'Lovecká saláma' was represented by 28.0 %. Most of this product (58.33 %) was produced by Slovak producers and 41.66 % was produced by Czech producers. 'Lovecká saláma' is also registered as TSG without name reservation and Slovak republic has only 2 registered producers for production of 'Lovecká saláma' as TSG. Therefore just 8.33 % of this product was marked by TSG logo.

'Liptovská saláma' is registered as TSG with name reservation and just 2 producers can produce this product. In Slovak market it is rare meat product and we did not find any. On the other hand we found products with similar name, as 'Litovská saláma' or 'Jemná saláma z Liptova', but these products have different composition.

In Slovakia, there is no producer of 'Ovčí hrudkový syr – salašnícky' and 'Ovčí salašnícky údený syr' that has these products registered as TSGs. It is due to high fees for registration, as for most small shepherd's huts it is not economically advantageous. Sheep lump cheese is a market article of shepherd's huts. Since huts are under self-production management, they sell 'Ovčí hrudkový syr – salašnícky' and 'Ovčí salašnícky údený syr' directly to consumers through small shops being part of the huts. But many huts sell their products through their sales network which consists of travelling shops or small local shops in their region. Huts with higher count of animals produce higher amounts of sheep cheese and they can distribute them into franchise shops in towns. Many small shepherd's huts distribute sheep lump cheese to large producers of bryndza cheese, because sheep cheese (not smoked) is an intermediate product for making bryndza cheese.

Benefits of shepherd's huts lie in producing sheep lump cheese from non-pasteurized milk. This way of production keeps tradition of making this sheep speciality for next generations. There are many benefits of making sheep lump cheese without milk pasteurization, because native microorganisms, vitamins and other substances beneficial for human health remain in it. When cheese is produced from non-pasteurised milk, it is necessary to maintain conditions of hygienic practices for food safety. One of the important steps in cheese making from non-pasteurised milk is the ripening process and conversion of lactose to lactic acid. In the market network, non-pasteurised sheep cheese is hard to find. Consumers can buy it only in local small shops which belong to shepherd's huts.

4.5. Information from inspections bodies

Authorities or bodies verifying compliance with the product specification in the Slovak Republic are BEL/NOVAMANN International, s r.o. (private) and Štátna veterinárna a potravinová správa SR (public). Checks by the authority or body verifying compliance with the product specification are performed once a year.

Minimum requirements and procedures to check the specific character of 'Spišské párky'

- adherence to the specified proportions of beef, pork and pork rind used as ingredients; for the production of 'Spišské párky' it is necessary to monitor the preparation of the beef and pork, which involves the selection of the ingredients and the quantities thereof according to the percentage of fat,
- checks on the addition of the pork rind,
- checks on the smoothness of the homogeneous mass; the homogeneity and smoothness of the mass is determined by sight and touch,

- adherence to the specified proportions of sweet and hot ground red paprika, having a colour intensity of 100 ASTA; the addition of the quantity of the mixture of ground sweet paprika (100 ASTA) and ground hot paprika, the nitrite mix, including the additives (polyphosphates E 450 and E 451 and ascorbic acid E 300) and water, is checked,
- checks on the use of sheep intestines, which are carried out on the basis of the supplier's delivery note,
- checks on the organoleptic properties of the finished product (external appearance and colour, appearance and colour of surface when cut, texture, odour and taste); these checks are carried out visually and by means of sensory analysis at the end of the production process to verify compliance with the characteristics specified in point 3.5 of the specification,
- checks on the physical and chemical properties of the finished product: maximum diameter of the sheep-intestine and weight of one link of sausage; the values must correspond to those specified under point 3.5 in the specification,

Minimum requirements and procedures to check the specific character of 'Liptovská saláma'

- adherence to the specified proportion of ingredients and spices.
- During the technical process a visual check is made of the addition of fresh pork fat as the final ingredient. The amounts of spices (mace, nutmeg and ginger) prepared are checked before they are added. The amounts are checked against the amounts specified in the recipe.
- adherence to the technical process during the step in which a fine homogenous product is produced without granulation, and smoking,
- the homogeneity of the product is checked before it is fed into casings, checks are carried out visually and the level of smoking is checked by measuring the temperature of the smoke, which may not exceed 69 °C, and the duration of the smoking, which is between 10 and 15 minutes,
- physical indicators of the finished product: cylindrical shape and elasticity of the product,
- chemical indicators of the finished product: fat content, salt content, net muscle protein.
- The values must correspond to those specified under point 3.5 in the specification.
- organoleptic properties of the finished product (appearance and colour of surface when cut, aroma and taste, consistency): the check is carried out visually and by means of sensory analysis at the end of the production process and corresponds to the characteristics specified in point 3.5 in the specification.

Minimum requirements and procedures to check the specific character of 'Špekáčky'

- compliance with the proportions of ingredients, additives and seasoning in accordance with the recipe; the preparation process involves cross-checking against the recipe;
- checking that the bacon pieces (špek) are unevenly distributed in the thicker mixture with a smallish proportion of collagen particles; visual check carried out during the technological production process after the process of stuffing into the natural intestine and dividing the individual pieces with string;
- compliance of the product's shape, surface appearance, colour and consistency; visual check carried out after heat-processing, spraying and cooling of the finished product;
- compliance of the appearance and colour when sliced; visual check carried out after heat-processing, spraying and cooling of the finished product;
- compliance of flavour, smell, consistency and juiciness of the product; sensory check of the finished product carried out after heating;
- compliance of the physical and chemical composition of the product; the finished product is examined by the approved laboratory methods.

Minimum requirements and procedures to check the specific character of 'Lovecká saláma'

- observance of the proportions of the raw materials, ingredients and spices in the recipe; the checks are conducted by comparing the quantities of raw materials, ingredients and spices with the recipe during the preparation of the product mixture,
- observance of the specified shape, external appearance, colour and consistency of the product: a visual check is carried out upon completion of the drying of the finished product,
- observance of the specified appearance and colour of the cut cross-section of the product; a visual check is carried out upon completion of the drying of the finished product,
- observance of the specified consistency, aroma and taste of the product; checks are carried out by sensory analysis of the finished product,
- observance of the specified physical and chemical parameters of the product; the finished product is examined using approved laboratory methods.

Minimum requirements and procedures to check the specific character of 'Ovčí hrudkový syr-salašnícky' or 'Ovčí salašnícky údený syr'

Although no producers of 'Ovčí hrudkový syr – salašnícky' or 'Ovčí salašnícky údený syr' are currently registered in the Slovak Republic, it is possible to buy these products in huts or small local farmers shops in the quality defined in the application for registration of 'Ovčí hrudkový syr – salašnícky' or 'Ovčí salašnícky údený syr'. Inspections by the competent authorities or bodies verifying compliance with the product specifications are performed once a year. These checks are carried out on the following:

- the raw materials used: fresh raw milk from grazing sheep and sheep fed with feed from mountain and foothill pastures. Inspection is carried out in the form of visual checks during milking and on the basis of milking records,
- production in shepherd's huts and seasonality of production (April to September),
- during the technological process, temperature of the milk prior to curdling and processing of the curds by hand; shape of the cheese which is checked visually after the lump was formed; ambient temperature in the storage area which is monitored during fermentation.

Checks are carried out on the basis of records of the temperature during fermentation,

- physical indicators of the finished product: shape and weight. Checks are carried out visually and by weighing,
- chemical indicators of the finished product: dry matter content, fat content in dry matter; chemical values must correspond to those specified under 3.5 in the specification.

Checks are performed by means of laboratory analyses,

- organoleptic properties of the finished product: external appearance and colour, appearance and colour in cross-section, taste and smell, consistency. The organoleptic properties are checked after the technological process of cheese-making was completed.

Checks are carried out by means of a sensory analysis of the finished product,

- use of implements, which is subject to approval of the operation of shepherd's hut.

For 'Ovčí salašnícky údený syr', checks moreover include the use of hardwood for smoking (beech, oak, etc.). Checks are carried out on the basis of records of the smoking process. These check are also performed once a year, as for 'Ovčí hrudkový syr – salašnícky'.

4.6. Introduction of university

The University of Veterinary Medicine and Pharmacy in Košice is the only institution of its kind in the Slovak Republic in the field of higher education in veterinary medicine and one of the two institutions providing education in pharmacy. Currently provides education in the following accredited programs: 1st, 2nd and associated first and second level of higher education - cynology, feed and food safety, the relationship of man - animal and its use in canine therapy and hippotherapy, market and food quality, general veterinary medicine, food hygiene and pharmacy. It also provides education in 15 accredited programs of 3rd level of higher education.

University of Veterinary Medicine and Pharmacy in Košice was one of the partners in this project through Department of Hygiene and Food Industry Technology. The role of our Department was collect information from the markets of appearance of Slovak TSG meat and milk products and evaluate obtained information. Our Department also carried out part of analysis of V4 TSG products in order to determine quality of these products. Specifically, we measured the percentage of fat in TSG products by Soxhlet method.

4.7. Material and methods used as part of the project

The University of Veterinary Medicine and Pharmacy in Košice was perform determination of fat content by Soxhlet method. The method is based on extraction of fat from meat products with an organic solvent in a Soxhlet apparatus. Fat is determined indirectly from the initial sample weight after deduction of extracted fat weight.

The dried sample (after the determination of water) was quantitatively transferred on the marked and weighed filter paper with cotton wool. A package refastened with the piece of string was created, weighed with an accuracy of ± 0.001 g and placed in the middle part of the extraction apparatus. Solvent in a volume that exceeds 1.5 times the volume of the extractor was poured into boiling flask and the flask was attached to the apparatus in the lower part. The sample was extracted by heating for 1 hour so that the solvent flow through the sample at least 5 times. After extraction, the sample was taken, and finish drying in an open oven at 105 ° C for one hour. After cooling in a desiccator, the sample was weighed.

Calculation of fat content (%):

$$x = (m_1 - m_2) / m_0 \times 100$$

m_0 - the weight of the initial sample (before drying) in g

m_1 - weight of the sample before extraction (g)

m_2 - weight of the sample after extraction (g)

4.8. Results and discussion of products from Slovak market

Actual situation in the quality of 'Spišské párky'

'Spišské párky' are meat product, which are registered as a TSG with reservation of the name. The raw material composition, as well as their physical, chemical and organoleptic characteristics are clearly defined. If a manufacturer wishes to produce 'Spišské párky', they must comply with the prescribed production process and raw materials used, as stated in the application for registration in the register of TSG. Slovak republic has 20 registered producers which can produce TSG 'Spišské párky', which in terms of uniformity can pose a risk. Therefore, one of our objectives was to compare the quality of 'Spišské párky' based on the manufacturers declared composition as well as to verify compliance with prescribed legislative raw material composition. In this way, we evaluated 'Spišské párky' of 17 producers.

Based on the obtained results we can conclude that 'Spišské párky' are not uniformed, and producers do not comply with the prescribed composition. The biggest differences (deficiencies) were recorded in the percentage of meat in this product. 'Spišské párky' should contain 80.2 % of meat. Just product of five producers contained this percentage of meat. Two producers used more than 80.2 % of meat, four producers used less percentage of meat and amount of meat in six products is dubious, because producers declared usage of pork bacon / fat but without stating of percentage on the label (Figure 4.6.).

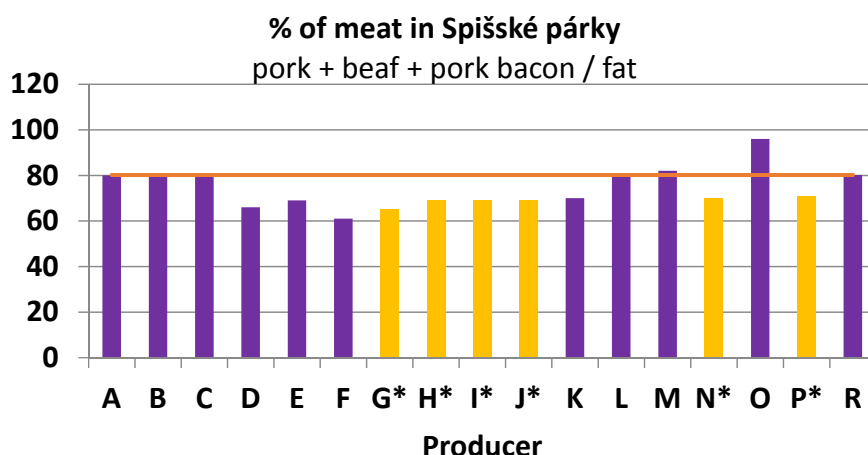


Figure 4.6. Percentage of meat in 'Spišské párky'
 Legend: Red line - % of meat according to application for registration (80,2 %); Producers marked with * - usage of pork bacon / fat but without % on the label

Content of pork in 'Spišské párky' should be 59 %. Five evaluated products contained less percentage of pork, four products contained the prescribed amount of pork, one product contained more than 59 % of pork and percentage of pork in the other 'Spišské párky' is dubious because producers declared usage of pork bacon / fat but without stating of percentage (Figure 4.7.).

On the other hand, the use of pork bacon (or fat) in 'Spišské párky' is questionable. An application for registration TSG states that only pork with fat content max. 10 % and max. 50 % should be use for production of 'Spišské párky'. Pork bacon (fat) contains a higher percentage of fat, which affects one of the chemical property of the product - the fat content. Eight producers used pork bacon (or fat).

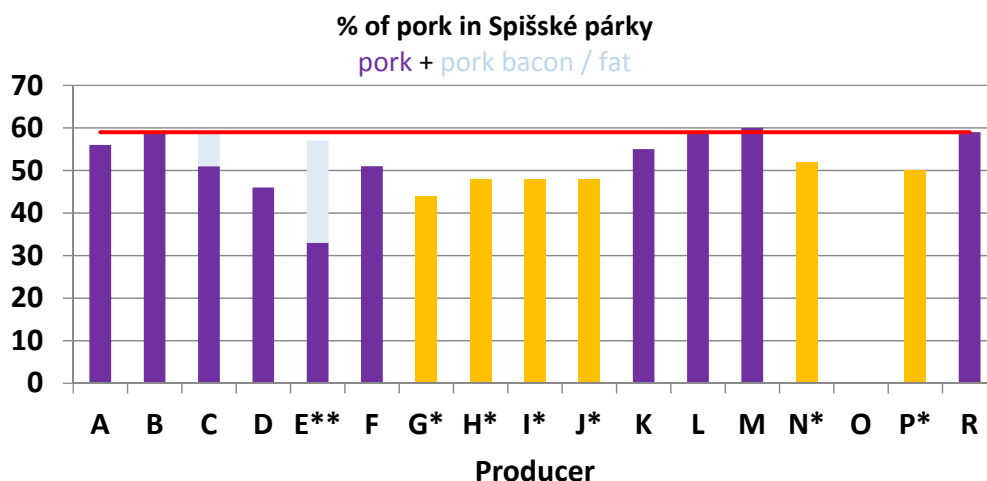


Figure 4.7. Percentage of pork in 'Spišské párky'
 Legend: Red line - % of pork according to application for registration (59 %); Producer E ** - the product contains at least 33 % of pork and 24 % of bacon; Producers marked with * - usage of pork bacon / fat but without % on the label; Producer O - only the total percentage of meat

Significant differences were also observed in the percentage of beef (Figure 4.8.). To produce 'Spišské párky' 21.2 % of beef should be used. This requirement was met only by nine producers. Two producers used more than 21.2 % of beef and 'Spišské párky' of five producers contained less percentage. The percentage of beef in 'Spišské párky' ranged from 10 % to 24 %.

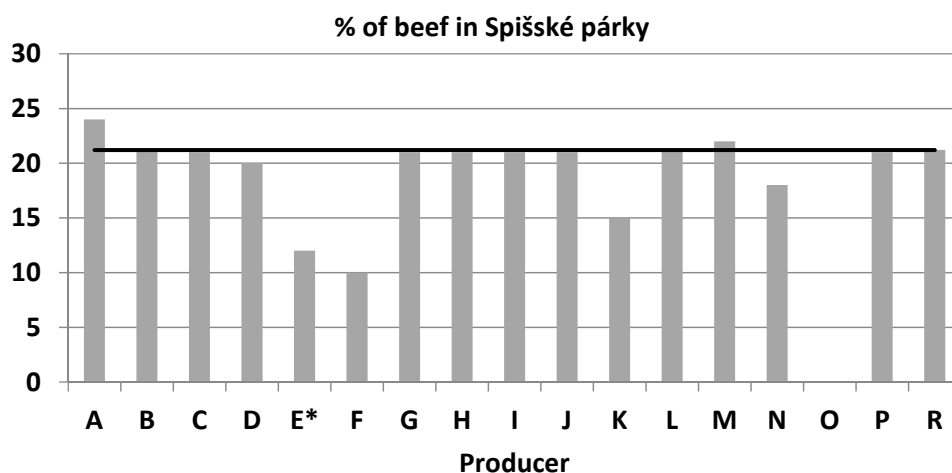


Figure 4.8. Percentage of beef in 'Spišské párky'

Legend: Red line - % of beef according to application for registration (21,2 %); Producer E marked with * - the product contains at least 12 % of beef; Producer O - only the total percentage of meat

Little differences were found also in the use of other ingredients as shows table 4.1.

Table 4.1 Other ingredients used in production of 'Spišské párky', declared by producers

Producer	Pork rind	Water	Nitrite salting mix	Sweet paprika	Hot paprika	Polyphosph.	Ascorbic acid	Other
A	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
B	12 %	21 %	Yes	Yes	Yes	E 450 + E 451	Yes	
C	12 %	Yes	Yes	Mixed spices		E 450 + E 451	Yes	
D	Yes	Yes	Yes	Natural spices		E 450	Yes	
E	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
F	10 %	Yes	Yes	Yes	Yes	E 450	Yes	
G	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
H	Yes	Yes	Yes	Paprika		E 450 + E 451	Yes	
I	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
J	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
K	Yes	Yes	Yes	Mixed spices		E 450 + E 451	Yes	
L	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
M	Yes	Yes	Yes	Yes	Yes	E 450	Yes	
N	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
O	No	Yes	Yes	Yes	Yes	No	No	Garlic
P	Yes	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	
R	12 %	Yes	Yes	Yes	Yes	E 450 + E 451	Yes	

One of the objectives was to compare the chemical composition of ‘Spišské párky’ produced by bigger and smaller producer. The results are shown in table 4.2. ‘Spišské párky’ produced by bigger producer seem to be better, because of higher amount of meat protein and lower amount of fat. ‘Spišské párky’ of both producers meet the requirements for percentage of fat (max 24 ± 4 %) and salt (max 2 ± 0.4 %). The sensory evaluation shown Figure 4.9. Content of muscle protein must be min 10 % and this requirement is met only by bigger producer. Tests for usage of starch and hydrocoloids, which are prohibited in this product, were negative. Another not allowed ingredient is mechanically separated meat. Presence of this ingredient in ‘Spišské párky’ of bigger producer was dubious but in ‘Spišské párky’ of smaller producer was positive.

Table 4.2 Evaluation of chemical properties of ‘Spišské párky’

	Dry matter (%)	Fat (%)	Meat protein (%)	Salt (%)	Starch	Hydrocoloids	MSM
203/16	36.87	18.86	14.48	1.90	-	-	Dubious
204/16	36.44	24.23	9.76	1.49	-	-	Positive

Legend: 203/16 – bigger producer, 204/16 – smaller producer

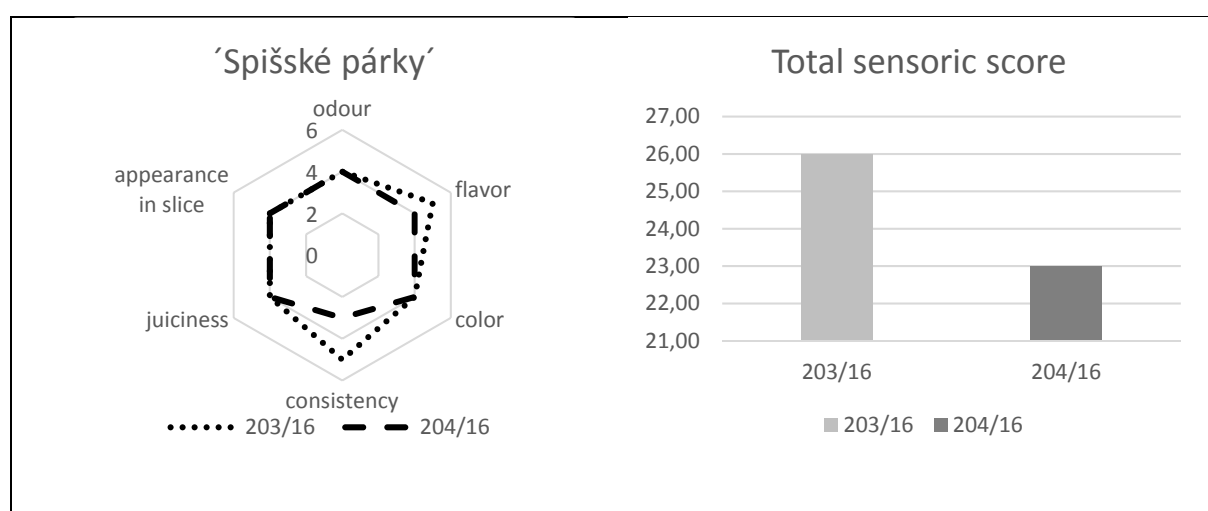


Figure 4.9.: Sensory comparison of ‘Spišské párky’

Actual situation in the quality of ‘Liptovská saláma’

‘Liptovská saláma’ is meat product, which is registered as a TSG with reservation of the name. As was mentioned above, it is rare product in Slovak markets. This product we could not find in stores, so we could not assess its properties. But we found product with similar name ‘Jemná saláma z Liptova’. Composition of this product was evaluated and we found that this product has different composition than ‘Liptovská saláma’.

‘Jemná saláma z Liptova’ consisted of (label information): pork (30 %), beef (9 %), mechanically separated pork (9 %), pork bacon (8 %), pork rind (? %), water, starch, salt, pork protein, E 450, E 621, E 635, E 300, E 250, E 120, E 262, E 331, spices and extracts.

Actual situation in the quality of 'Špekáčky'

'Špekáčky' are registered as TSG without name reservation. It means that in the market we can find 'Špekáčky' with or without TSG logo. According to labels information we can say that non-TSG 'Špekáčky' have different composition compare to TSG product (table 4.3). Here are two examples of composition of non-TSG 'Špekáčky':

1. pork (min 25 %), beef (min 15 %), bacon (? %), water (? %), pork rind (? %), starch (? %), soy protein (? %), fiber from soybean (? %), E 250, E 262, E 451, E 621, E 315, E 407a, spices, salt, glucose
2. pork and beef (min 40 %), bacon (? %), water (? %), pork rind (? %), animal (porcine) proteins (? %), salt, modified starch E 1422, E 250, E 262, E 508, E 450, E 621, E 635, E 1450, E 300, E 120, E 412, E 407, E 417, natural spices, potato starch, sweet paprika, dextrose, garlic

We also compared chemical properties of 'Špekáčky' with and without TSG mark. Both products met the requirements of percentage of salt (max 2.5 %), percentage of fat (max 45 %), percentage of starch (2.5 %) and percentage of meat protein (min 6 %). 'Špekáčky' which were produced as TSG contained lower amount of fat and higher amount of meat protein. 'Špekáčky' which were produced as non-TSG also met requirements which are defined for TSG, but on the other hand consisted starch and soy protein, which are not allowed in TSG. Results of presence of mechanical separated meat was in both products dubious (Table 4.3). The sensory evaluation shown Figure 4.10.

Table 4.3 Evaluation of chemical properties of 'Špekáčky'

	Dry matter (%)	Fat (%)	Meat protein (%)	Salt (%)	Starch	Hydrocoloids	MSM
202/16	37.64	24.19	11.29	1.56	-	-	dubious
201/16	43.94	27.77	10.16	1.92	+	+ soy proteine	dubious

Legend: 202/16 – product with TSG logo, 201/16 – product without TSG logo

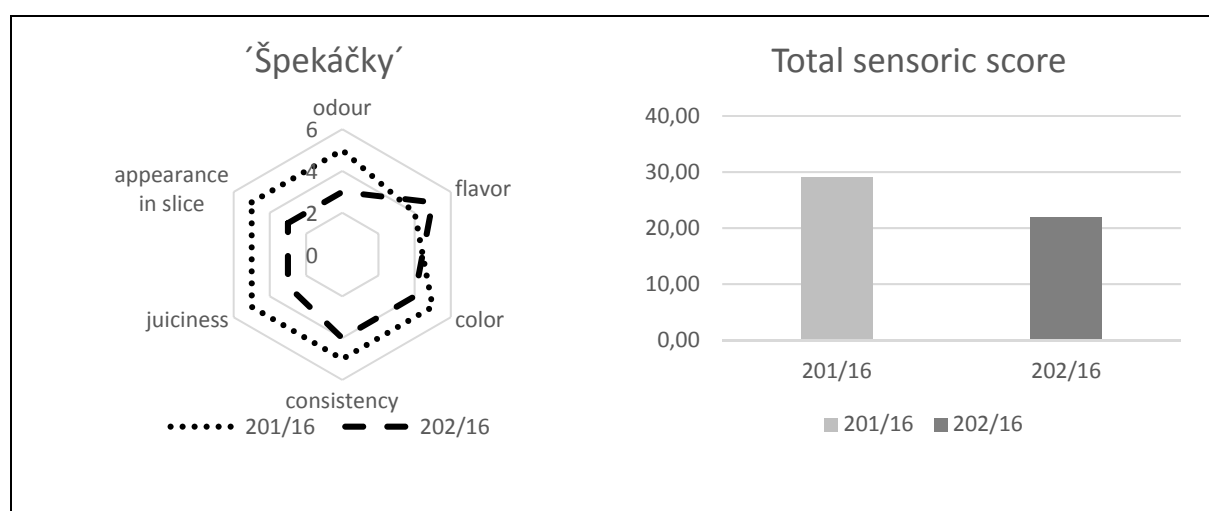


Figure 4.10.: Sensory comparison of 'Špekáčky'

Actual situation in the quality of 'Lovecká saláma'

'Lovecká saláma' is also registered as TSG without name reservation. It means that in the market we can find 'Lovecká saláma' with or without TSG logo, and as was mentioned above, in Slovak

markets prevail products without TSG logo. ‘Lovecká saláma’ without TSG logo has different composition compare to TSG products (table 4.5). Here are some examples of composition of non-TSG ‘Lovecká saláma’:

1. pork (? %), pork bacon (? %), beef (? %), salt, dextrose, natural spices, spices extracts, E 621, E 300, E 150c, E 162, E 120, aroma, hemoglobin, starter cultures, E 250
Per 100g of finished product, 112 g of meat was used.
2. pork (? %), beef (? %), salt, E 250, dextrose, natural spices, E 300, spices extracts, starter cultures
Per 100g of finished product, 150 g of meat was used.

We also compared chemical properties of ‘Lovecká saláma’ with and without TSG mark. TSG ‘Lovecká saláma’ in comparison to non-TSG product contained lower percentage of dry matter, lower percentage of fat, salt and also meat protein. Both products were without starch and hydrocoloids and met requirements for TSG ‘Lovecká saláma’. Result of test for mechanically separated meat was dubious in both cases (Table 4.4). The sensory evaluation shown Figure 4.11.

Table 4.4 Evaluation of chemical properties of ‘Lovecká saláma’

	Dry matter (%)	Fat (%)	Meat protein (%)	Salt (%)	Starch	Hydrocoloids	MSM
206/16	65.12	32.09	21.49	3.36	-	-	dubious
205/16	74.86	45.60	23.22	3.49	-	-	dubious

Legend: 206/16 – product with TSG logo, 205/16 – product without TSG logo

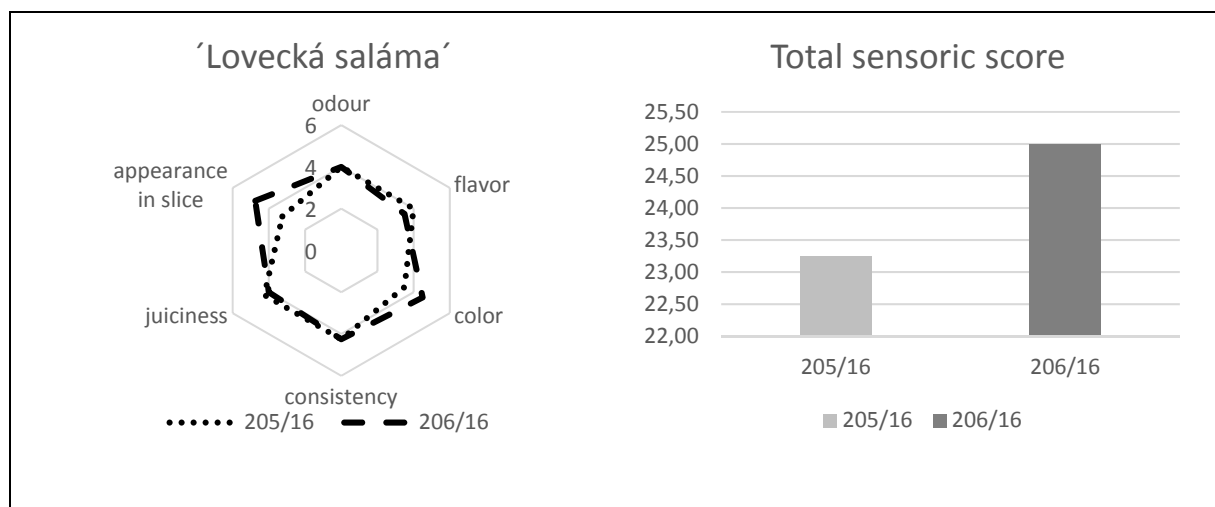


Figure 4.11.: Sensory comparison of ‘Špekáčky’

Actual situation in the quality of ‘Ovčí hrudkový syr-salašnický’ and ‘Ovčí salašnický údený syr’

The cheese samples were analysed for dry matter, fat, fat in dry matter, pH, NaCl, titratable acidity, lactic acid content and protein content. The dry matter content of the cheese samples was determined according to the method of desiccation to constant weight at 102±2°C (ISO 5534, 2004). The fat content was measured with butyrometer according to Van Gulik method and fat in dry matter was calculated from dry matter and fat content. Digital inoLab® pH 340i meter (Wissenschaftlich-Technische Werkstätten, Germany) with glass electrode probe was used to measure pH. The salt content of cheese samples was determined according to Mohr argentometric titration method.

Titrate acidity was determined by titrating with 0.25N sodium hydroxide and the lactic acid content was calculated from titrate acidity value.

Results of the selected sheep lump cheeses (table 4.5) show that cheese made from non-pasteurised milk meets the requirements of the application for registration except the pH value. Higher value of pH means that this cheese sample did not ripen completely and the process of fermentation was not finished to the optimal properties. By contrast, if the pH is lower, it is probably due to a longer process of ripening or the temperature in the ripening room was higher than optimal. It is also possible that lower pH can be caused by higher transportation temperature after cheese sampling, when in this type of cheese higher temperature leads to rapid fermentation of lactose to lactic acid and the pH value rises. The selected smoked sheep lump cheese has lower fat in dry matter content than required in the application for registration, but the difference is very small (-0.83%). In other properties, the sample complies with the requirements from the application to have 'Ovčí salašnícky údený syr' registered as a traditional speciality guaranteed.

Table 4.5 Results of laboratory analysis of milk products

Sheep lump cheese made from non-pasteurised sheep milk	Smoked sheep lump cheese made from pasteurised sheep milk
Dry matter: 47.34±2.98 %	Dry matter: 48.66±0.95%
Fat: 24.92±0.53%	Fat: 23.92±0.34%
Fat in dry matter: 50.67±2.48%	Fat in dry matter: 49.17±1.02%
pH: 6.26±0.01	pH: 5.30±0.07
NaCl: 0.11±0.00%	NaCl: 1.09±0.00%
Titric acidity: 27.33±0.47°SH	Titric acidity: 64.83±1.07°SH
Lactic acid: 1.46±0.02%	Lactic acid: 0.62±0.01%
Proteins: 21.43%	Proteins: 19.80%

5. Sensory evaluation of TSG products

5.1. Material and methods

Products purchased in the market networks of V4 countries were evaluated. This included 10 products from the Czech Republic, 8 products from Slovakia, 5 products from Poland, and 7 products from Hungary. The products were processed fresh.

Sensory evaluation was performed by 12 panellists who hold certificates for evaluation of meat and dairy products. The evaluation was conducted in the laboratory in compliance with the ČSN ISO 8589 standard at the Department of Meat Hygiene and Technology, UVPS Brno. The sensory panel included representatives from all V4 countries. Product evaluation was anonymous. 'Párky' and 'Špekáčky' were served after being warmed up in a water bath. Other products were served raw. The analysis was conducted from less spicy to hot products.

Evaluation parameters included odour, flavour, colour, consistency, juiciness, and appearance when cut. The maximum score for each parameter was 5, the maximum total score for a product was 30. The questionnaire also required personal data of evaluators, such as their age, gender, and nationality.

Evaluation of cheese is listed separately in the results of the Slovak Republic.

5.2. Sensory evaluation of products from Czech Republic

Results of sensory evaluation of the six-parameter range of the products purchased in the Czech market network is shown in figure 1.15. A summary assessment of palatability is presented in figure no. 1.16. As evident from the figure, the most palatable product was 199/16 'Dunajská klobása'. The second and third positions in the overall palatability was reached by 194/16 'Pražská šunka' boneless and 197/16 'Lovecký salám' with the same score. 192/16 'Špekáček' was evaluated as the worst product with the total score of 20.66. However, the sense of taste may vary according to nationality. Due to that, the sensory questionnaires were also evaluated from the perspective of nationalities, see figure 1.17. In the evaluation, there was a small number of Hungarian panellists as a result of which some of the products were not evaluated by this group. The results indicate that the Czech and Polish evaluators liked 199/16 'Dunajská klobása' the best. Hungarians liked 194/16 'Pražská šunka' boneless the best and Slovaks preferred both, 194/16 'Pražská šunka' boneless as well as 197/16 'Lovecký salám'. The overall average score for Czech products was 23.63.

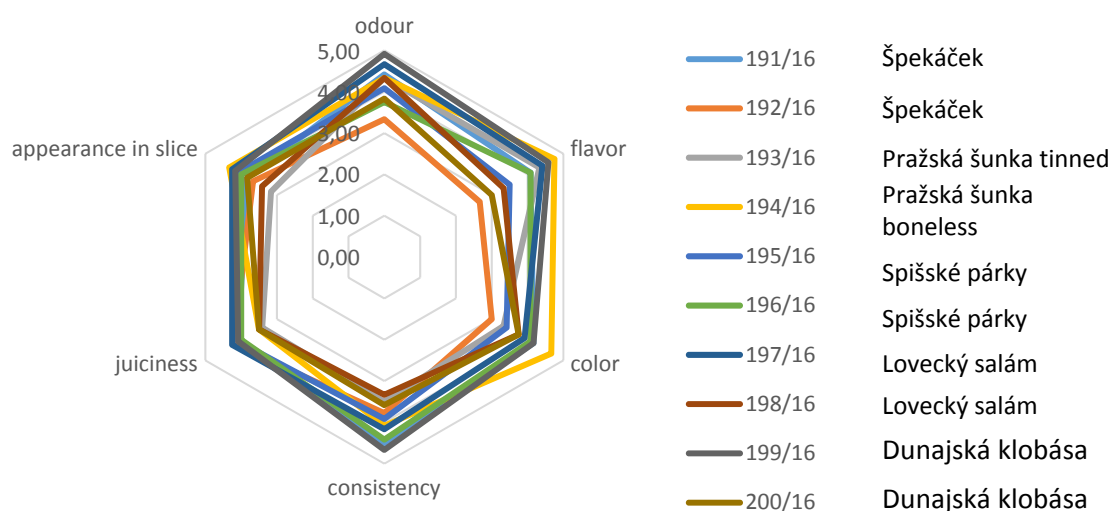


Figure 1.15: Sensory comparison of Czech products

The results below also demonstrate that the quality of individual products of identical names varies considerably. Surprisingly, differences are also in the taste of products which should be made according to the same recipe and the same technology registered in the TSG application. This specifically applies to 'Spišské párky' (products 195/16 and 196/16). The difference, however, cannot be evaluated as statistically significant.

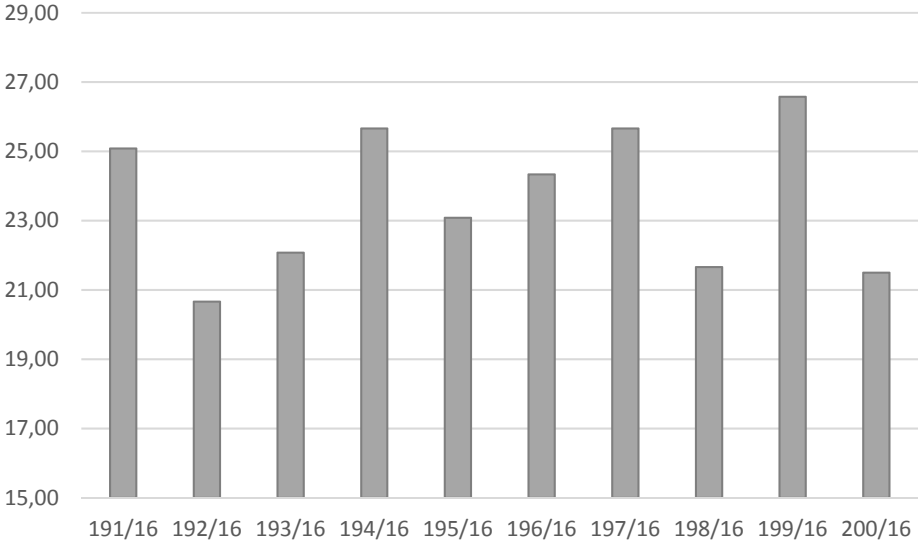


Figure 1.16: Total comparison of palatability of products purchased in the Czech Republic

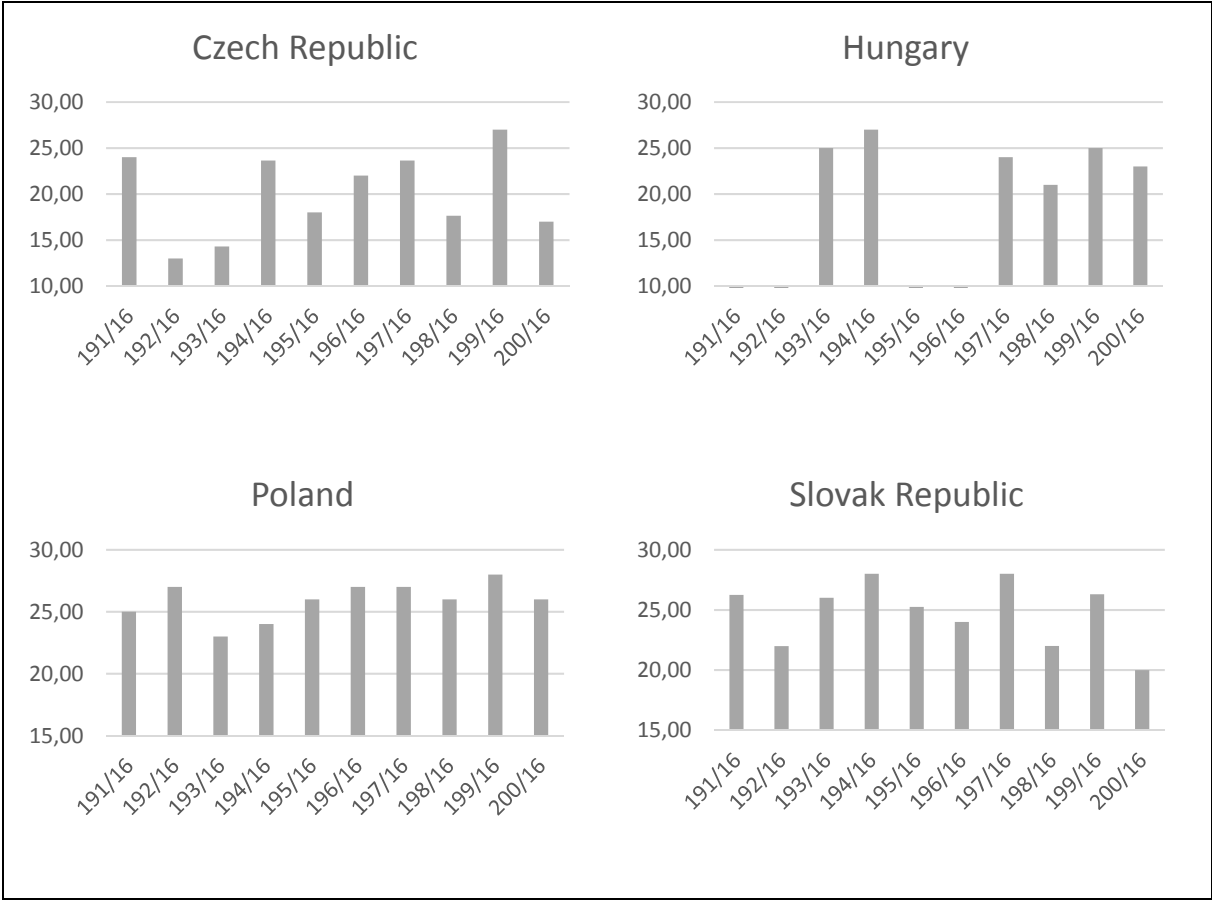


Figure 1.17: Total comparison of palatability of products purchased in the Czech Republic by nationality

5.3.Sensory evaluation of products from Hungary

Results of sensory evaluation of products purchased in the Hungarian retail network is shown in figure 1.18. A summary assessment of palatability is presented in figure no. 1.19. As evident from the figure, the most palatable product was 214/16 'Csabai sausage hot'. The second product ranked 215/16 'Budapest wintersalami' and the third position in the overall palatability was reached by 216/16 'Szeged wintersalami'. 218/16 'Tepertős pogácsa - Crackling patty' was evaluated as the worst product with the total score of 22.69. The overall average score for Hungarian products was 25.11.

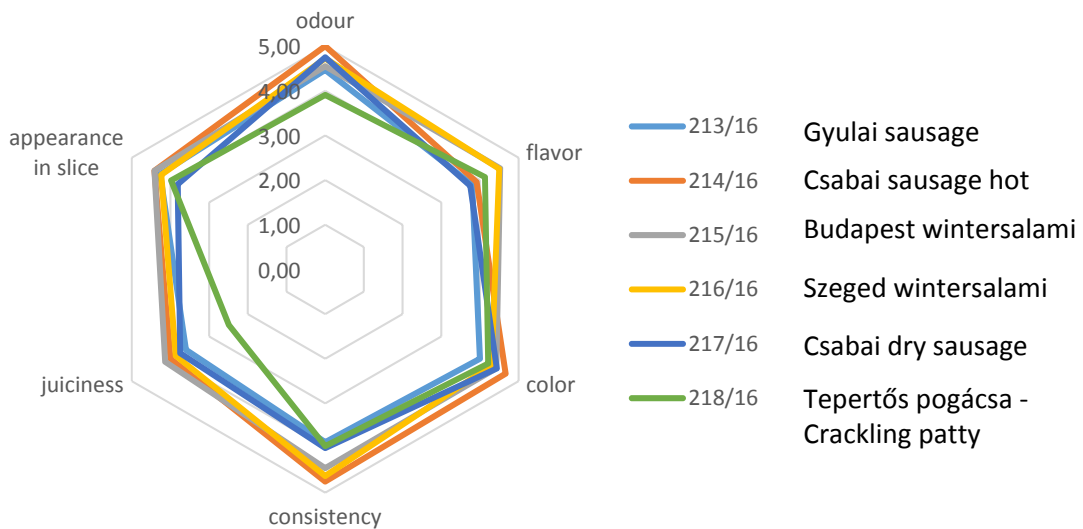


Figure 1.18: Total comparison of palatability of products purchased in Hungary

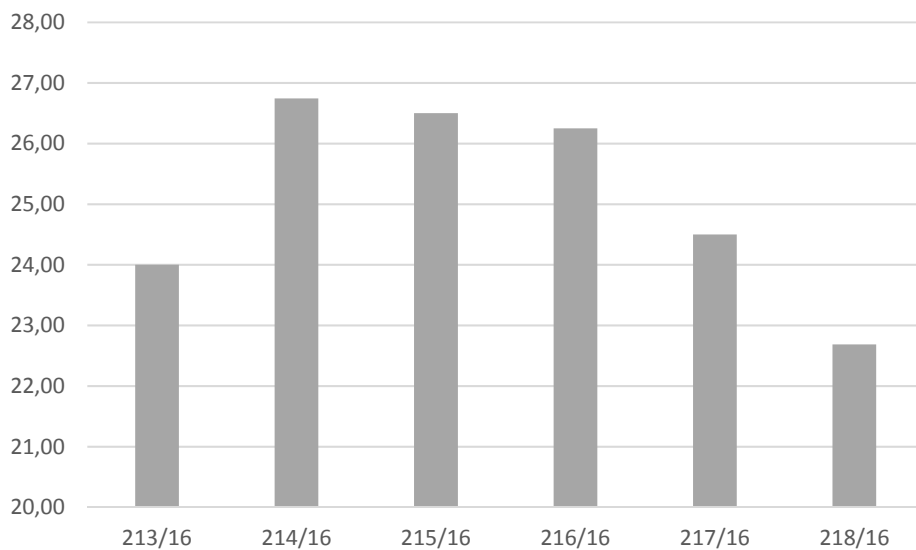


Figure 1.16: Total comparison of palatability of products purchased in Hungary

As mentioned before, tastes of individual nations may differ. Our results confirm this hypothesis. Evaluators from the Czech Republic ranked the best two products with the same score, namely the 214/16 'Csabai sausage hot' and 216/16 'Szeged wintersalami'. Due to their number, Hungarian evaluators did not evaluate 2016/16 'Gyulai sausage' and evaluated 215/16 'Budapest wintersalami' as the best. The same product was evaluated as the far best also by Polish evaluators. Slovak evaluators evaluated 214/16 'Csabai sausage hot' as the best.

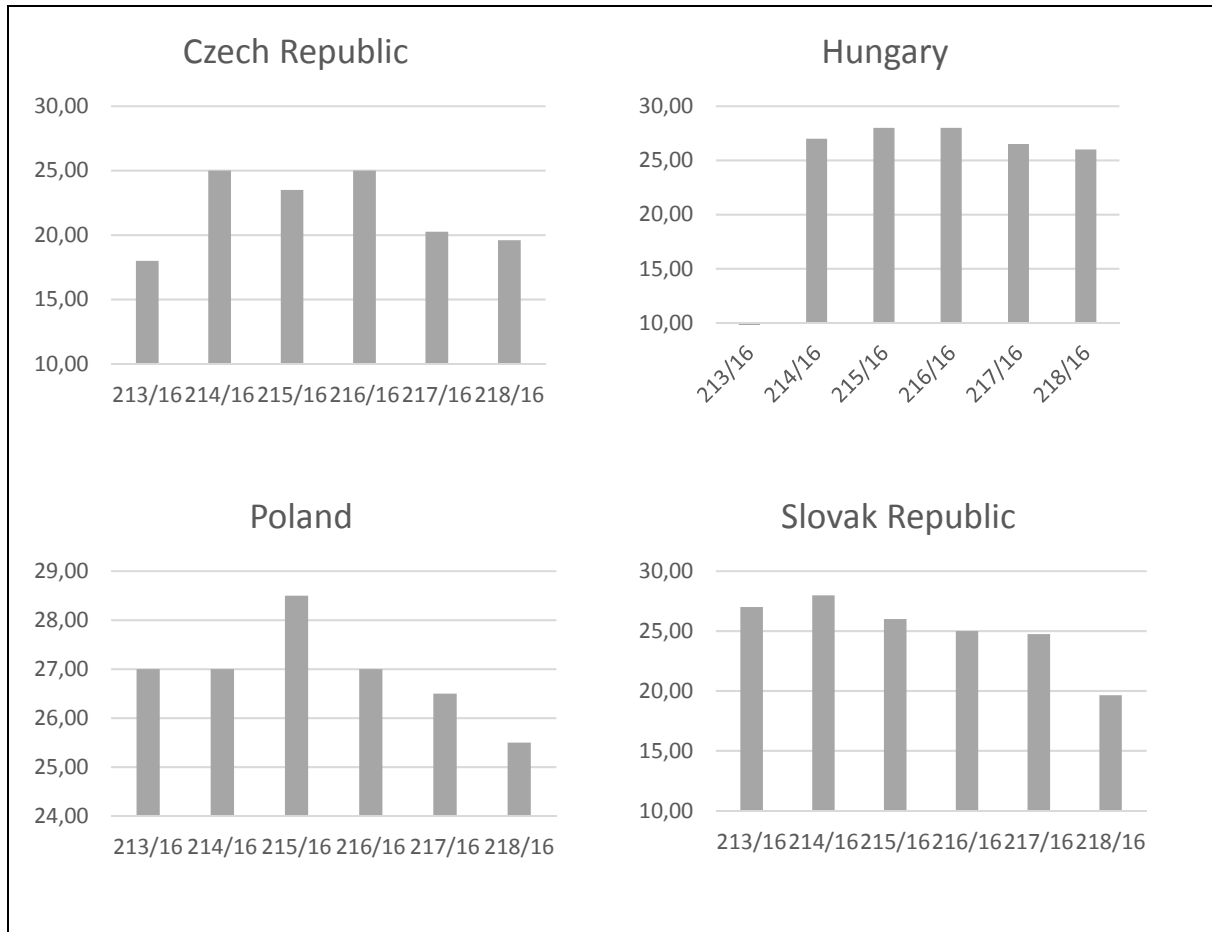


Figure 1.20: Total comparison of palatability of products purchased in Hungary by nationality

5.4. Sensory evaluation for product from Poland

Results of sensory evaluation of products purchased in the Polish retail network is shown in figure 1.21. A summary assessment of palatability is presented in figure no. 1.22. As evident from the figure, the most palatable product was 212/16 'Kabanosy'. The second product ranked 210/16 'Klobasa Mysliwska' and the third position in the overall palatability was reached by 219/16 'Kabanosy'. 209/16 'Klobasa Mysliwska' was evaluated as the worst product with the total score of 20.83. The overall average score for Polish products was 23.01.

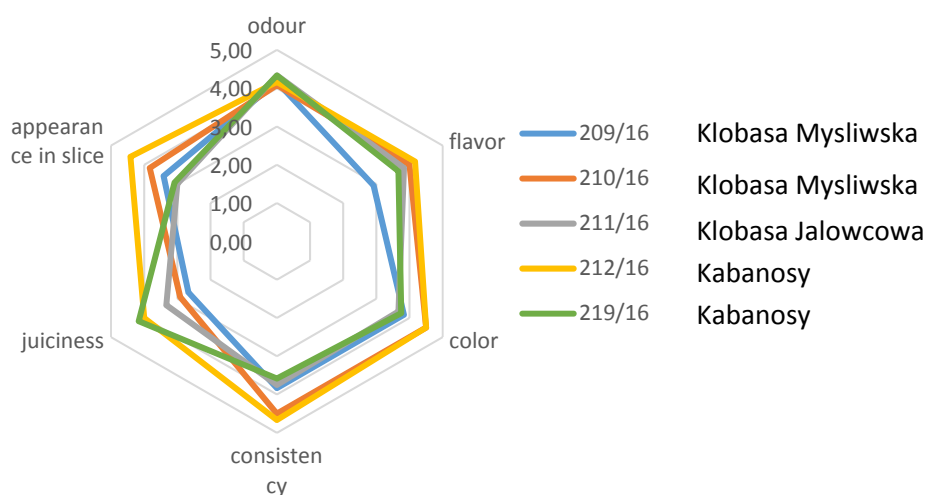


Figure 1.21: Sensory comparison of Polish products

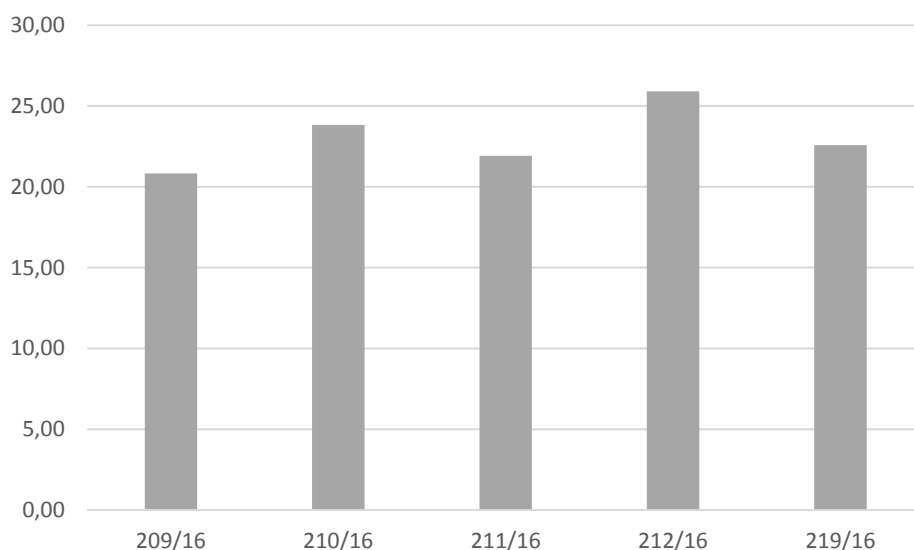


Figure 1.22: Total comparison of palatability of products purchased in Poland

With the perspective of various nationalities, there were also differences in terms of palatability of traditional Polish products, see figure 1.23. Czech evaluators rated 210/16 'Klobasa Mysliwska' the best. Hungarian evaluators rated 212/16 'Kabanosy' as the best product. Polish evaluators evaluated 211/16 'Klobasa Jalowcowa' as the best. Slovak evaluators ranked 219/16 'Kabanosy' from small production the best.

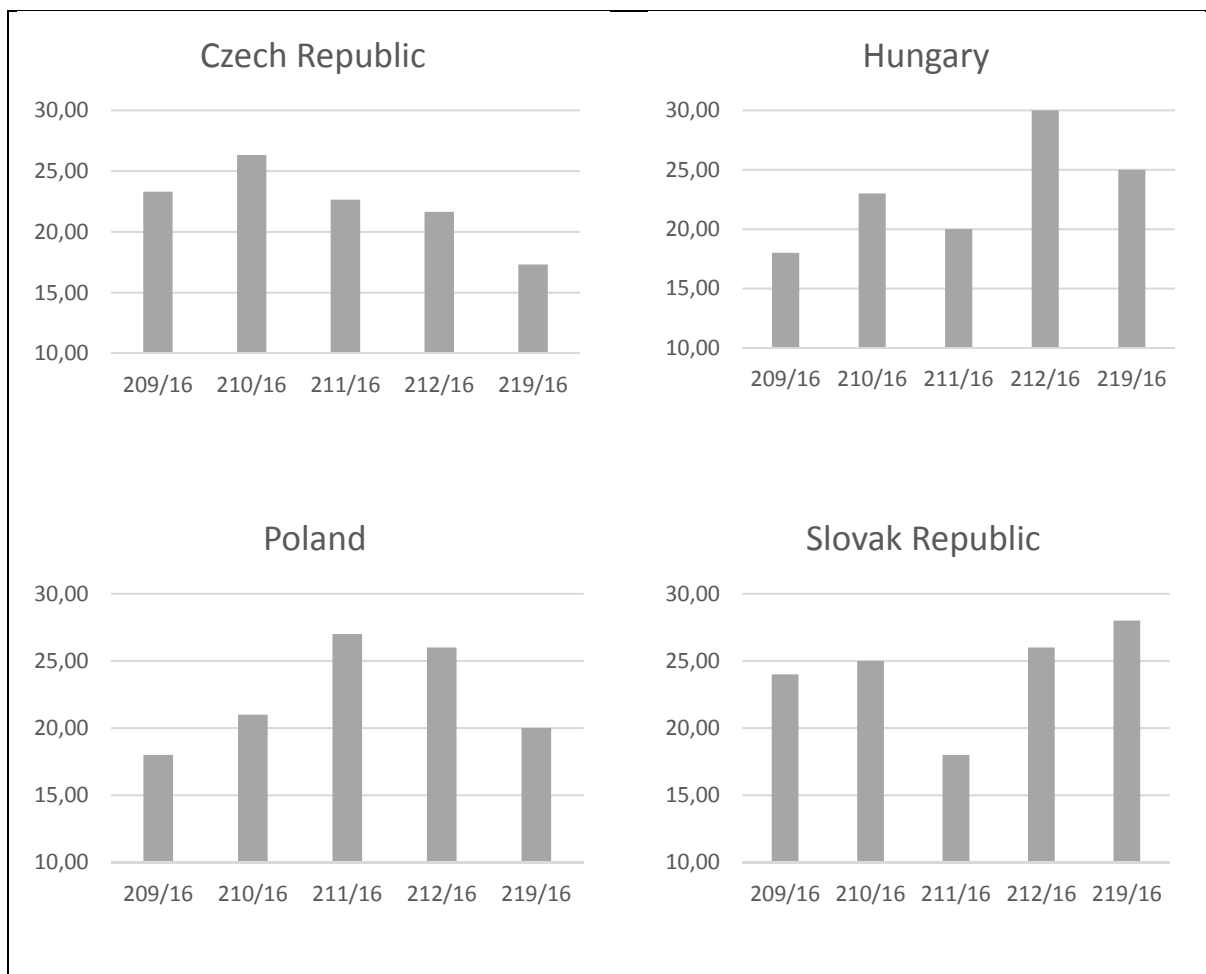


Figure 1.23: Total comparison of palatability of products purchased in Poland by nationality

5.5. Sensory evaluation of products from Slovakia

Part A: Meat products

Results of sensory evaluation of products purchased in the Slovak retail network is shown in figure 1.24. A summary assessment of palatability is presented in figure no. 1.25. As evident from the figure, the most palatable product was 206/16 'Lovecká saláma'. The second product ranked 202/16 'Špekáčky' and the third position in the overall palatability was reached by 201/16 'Špekáčky'. 205/16 'Lovecká saláma' was evaluated as the worst product with the total score of 19.08. The overall average score for Slovak products was 22.8. The results indicate that the quality 'Špekáčky' and 'Spišské párky' is comparable in terms of sensory impression. This is expectable for 'Spišské párky' since both of them were TSG products. For 'Špekáčky', this finding demonstrates that both products, i.e. with the TSG logo and without it, are equivalent in the sensory perspective.

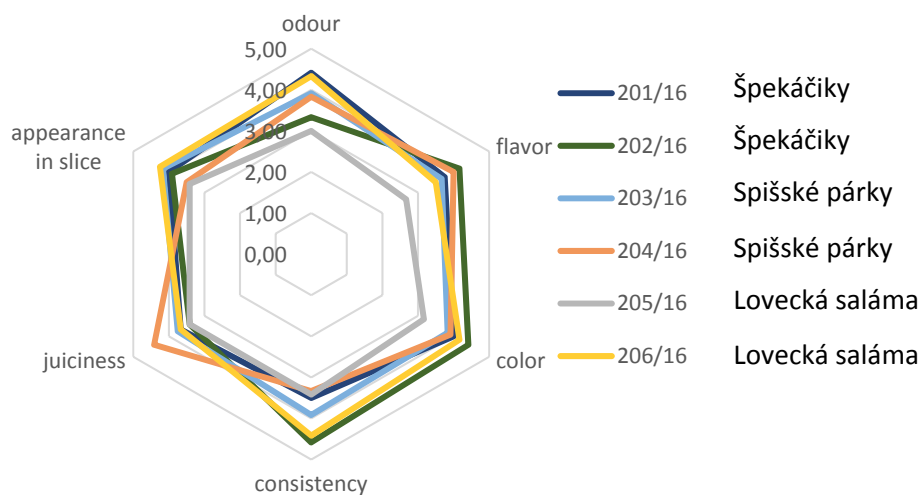


Figure 1.24: Sensory comparison of Slovak products

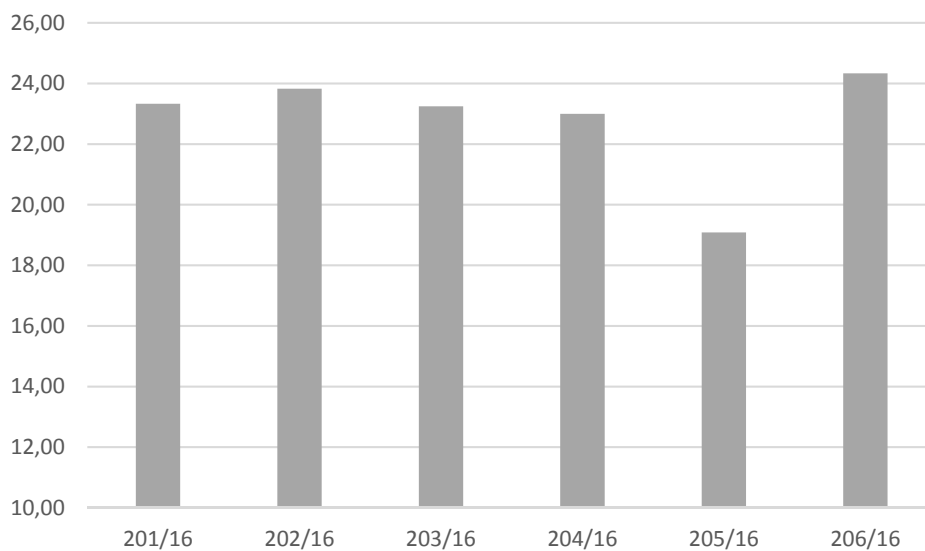


Figure 1.25: Total comparison of palatability of products purchased in Slovakia

With the perspective of various nationalities, there were also differences in terms palatability of traditional Slovak products, see figure 1.23. Czech and Polish evaluators rated 202/16 'Špekáčky' the best. For Hungarian evaluators, two best products reached the same score, namely 203/16 and 204/16, in both cases they were 'Spišské párky'. Slovak evaluators ranked 201/16 'Špekáčky' with the TSG logo the best.

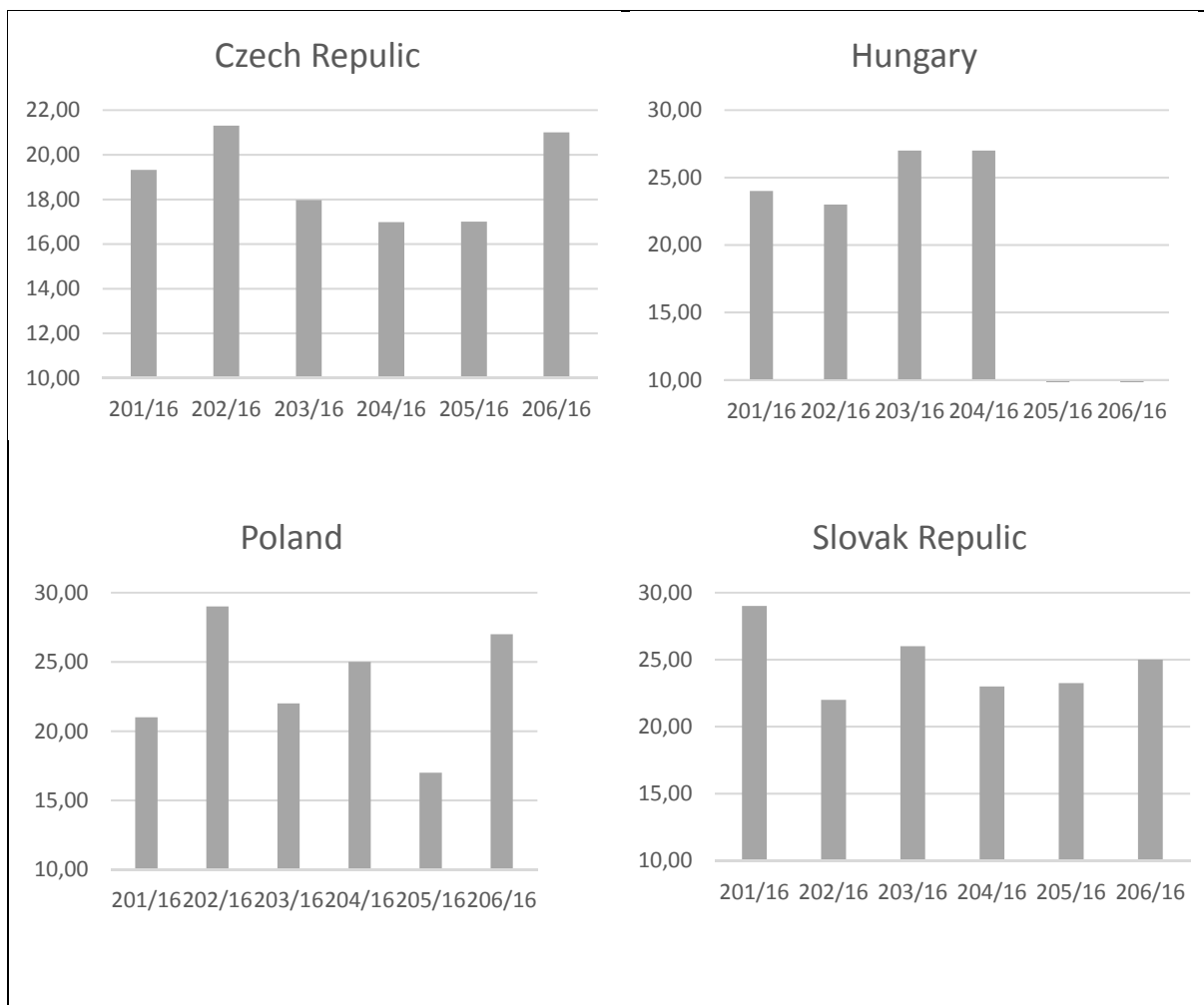


Figure 1.26: Total comparison of palatability of products purchased in Slovakia by nationality

Part B: Dairy products

Sensory evaluation of non TSG sheep lump cheese and smoked sheep lump cheese consists of a point score and evaluation of cheese sensory profiles. The point score was different than point scale for meat products. It was used point score to evaluate colour, external appearance, consistency and smell with a maximum of 20 points, and taste with a maximum of 30 points. In the sensory profile, consistency and flavour descriptors on an intensity scale from 1 to 6 were evaluated, where 1 was imperceptible and 6 intensively perceptible. Descriptors of consistency were: spreadable, homogenous, melting on tongue, gummy, greasy, curdy, crumbly, and breakable consistency. Flavour descriptors were: delicious, typical sheep cheese, piquant, well sour, salty, bitter, smoked and animal flavour.

Figure 4.1 shows sensory evaluation in point score of sheep lump cheese (blue) and smoked sheep lump cheese (red). Smoked sheep lump cheese was evaluated in total points score with 1020 and sheep lump cheese with 941 total point score from all evaluators. Figure 1 shows that evaluators prefer more smoked cheese than not smoked, because of its appearance, taste and smell. In colour and consistency was evaluated non-smoked sheep cheese better than smoked one.

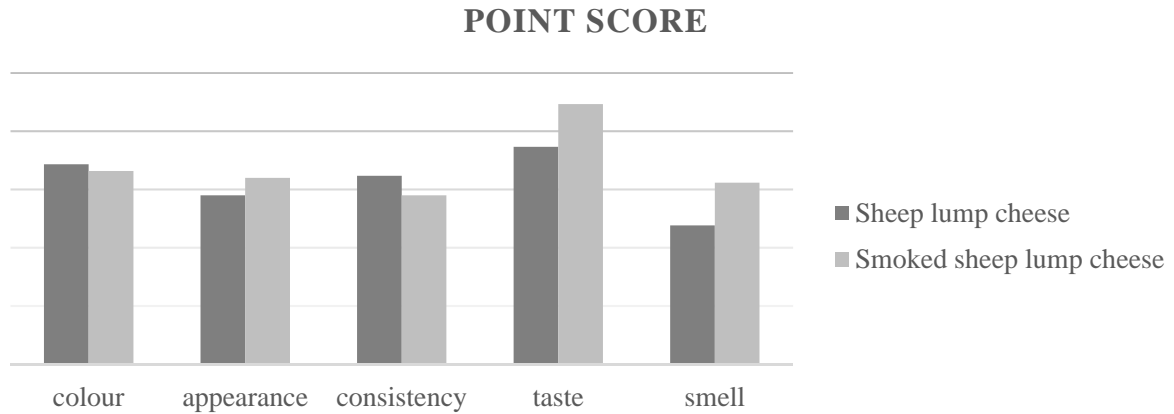


Figure 4.1, Point score of evaluated cheese samples

Figure 4.2 shows how evaluators from V4 countries evaluated traditional non-smoked and smoked sheep lump cheese from the Slovak Republic. Hungarian evaluator and evaluators from the Czech Republic preferred non-smoked sheep lump cheese. On the other hand, evaluators from the Slovak Republic and Poland preferred smoked sheep lump cheese.

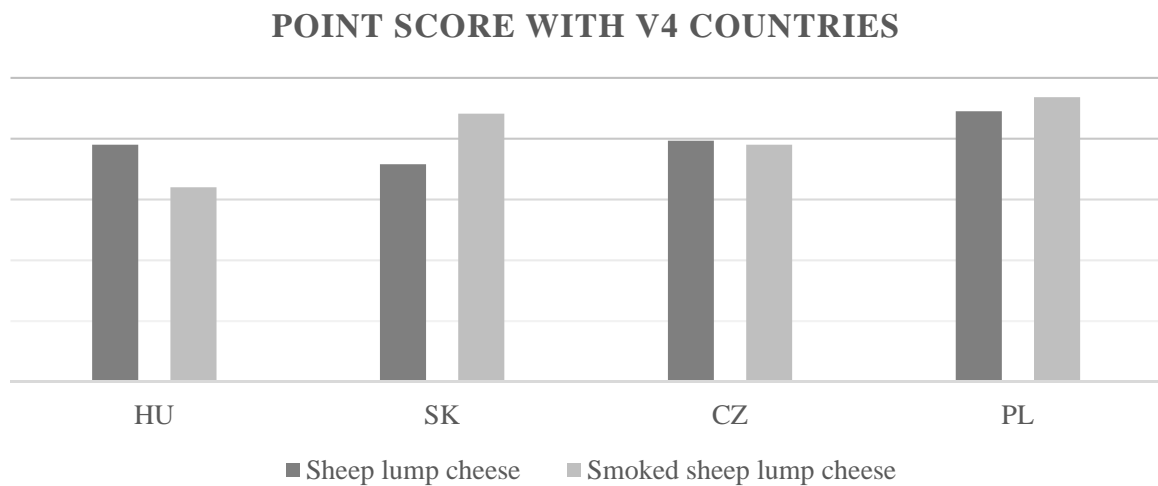


Figure 4.2, Sensory evaluation of evaluators from V4 countries

Figures 4.3 and 4.4 show sensory profiles of non-smoked and smoked sheep lump cheese. Sheep lump cheese was perceptible in homogenous consistency and in typical sheep cheese flavour (Figure 3). Smoked sheep lump cheese was evaluated as perceptible in homogenous consistency, same as the non-smoked and perceptible in delicious and smoked flavour.

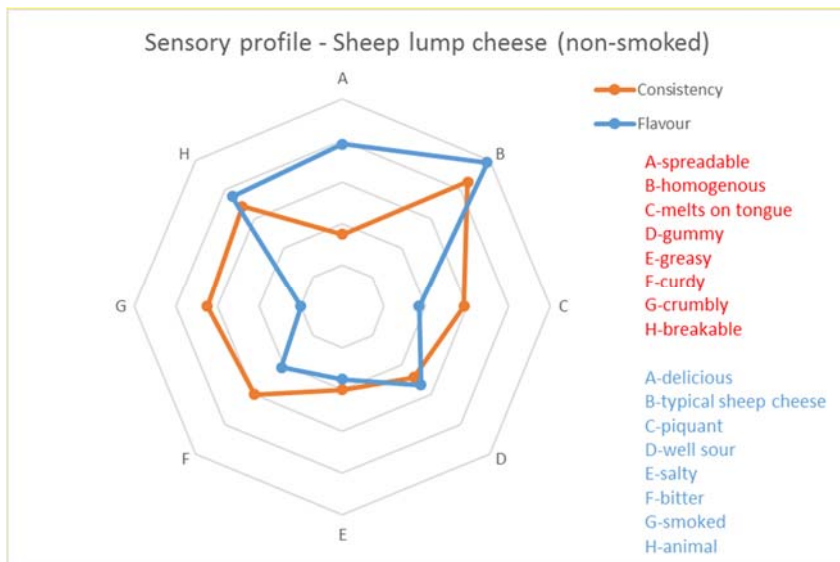


Figure 4.3, Sensory profile of sheep lump cheese

Other descriptors were evaluated on intensity scale from imperceptible to hardly noticeable in both samples.

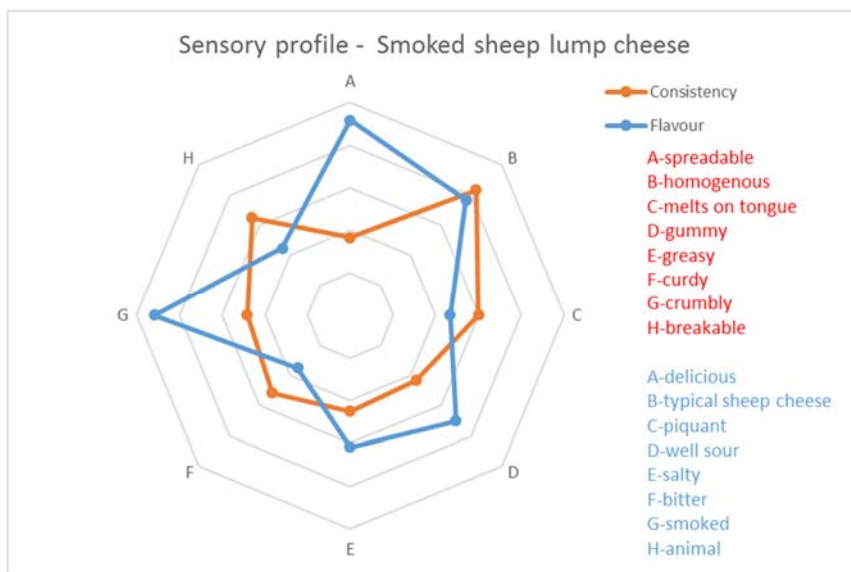


Figure 3 Sensory profile of Smoked sheep lump cheese

5.6. Sensory evaluation of all products without nationality point of view

In general, regardless of the nationality of evaluators, the best products evaluated were the following: 214/16 'Csabai sausage hot' (HU) 215/16 'Budapest wintersalami' (HU) a 199/16 'Dunajská klobása' (CZ) (in descending order). All of them are long-keeping products. Hungarian products fall into the category of PGI products, thus, they are products with the highest level of protection. They can therefore be produced only in a certain region in Hungary. The popularity of these products is also confirmed by the fact that the best product of the evaluation, namely the 'Csabai sausage', can be purchased in the Czech Republic. On the contrary, Czech 'Dunajská klobása' has no protection except the legislative framework based only on the Czech law (Decree 69/2016). Thus, manufacturing this product abroad could lead to manufacturing it of any raw materials and by any technology. The only limit would be restrictions on meat product category in which it would be included. Quality differences

of these products are, nevertheless, also in the Czech Republic, as shown in figure 1.16. Inclusion of 'Dunajská klobása' among TSGs could possibly lead to standardization of the product quality and in particular to the protection of traditional production technology and raw materials used.

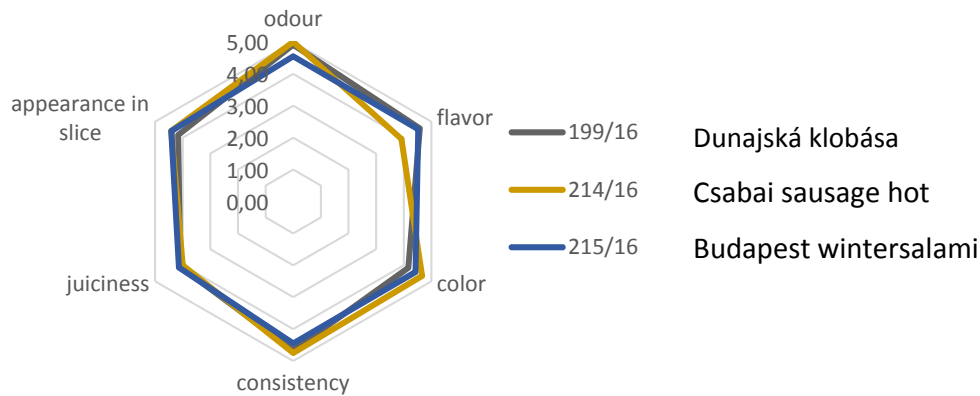


Figure 1.27: Sensory comparison of the three best products

Within the top ten products in overall palatability, 5 products of the Czech Republic dominated, 4 Hungarian products scored and one Polish product also reach a position. Slovak products were not evaluated as products with exceptional sensory properties. This fact is actually a surprising finding. Especially due to positions of products, such as 'Špekáčky' and 'Spišské párky', that are normally produced in the Slovak Republic and were also evaluated within the sensory analysis. Figure 1.28 shows the results of the overall evaluation of the top ten products palatability.

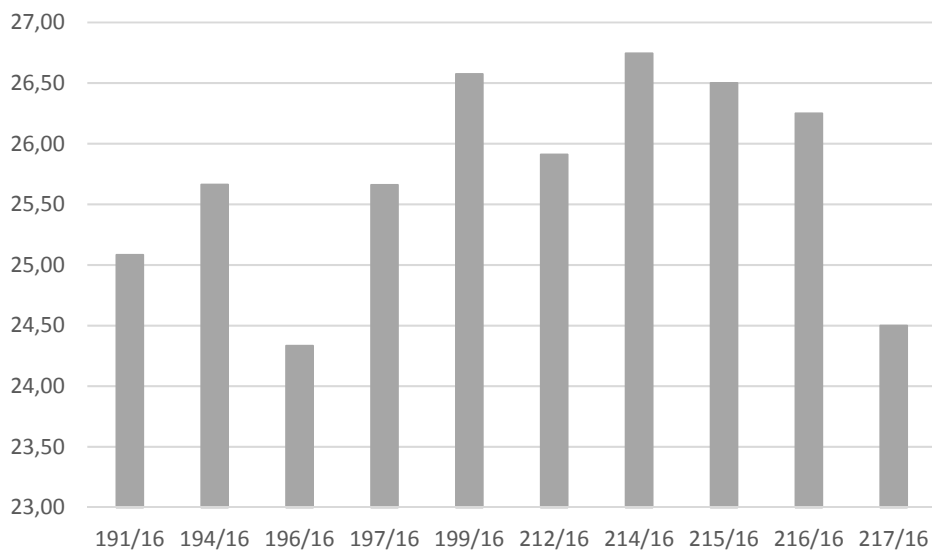


Figure 1.28: Total comparison of palatability of top ten products

The best overall palatability of products by nationalities is presented in figure 1.29. As the figure shows, this product was the most liked by Slovak evaluators, as well as Polish and Hungarian evaluators. On the contrary, Czech evaluators liked it the least. The reason may be a lower popularity of piquant products in the country.

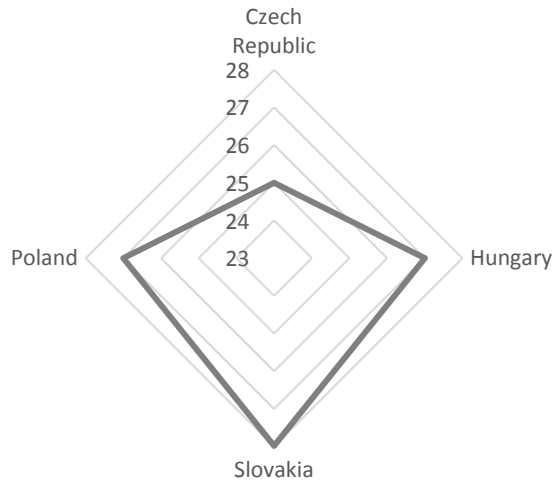


Figure 1.29: Total palatability comparison of 214/16 'Csabai sausage hot' (HU) by nationalities

The total score achieved by the country of purchase is displayed in figure 1.30. In the figure it is apparent that the Hungarian products dominate, with Czech products in the second place. Although Slovak products did not rate among the top ten products, they are in the third place. This fact indicates that the palatability of Slovak products was mostly average. A product from the Slovak market network was evaluated as the worst product.

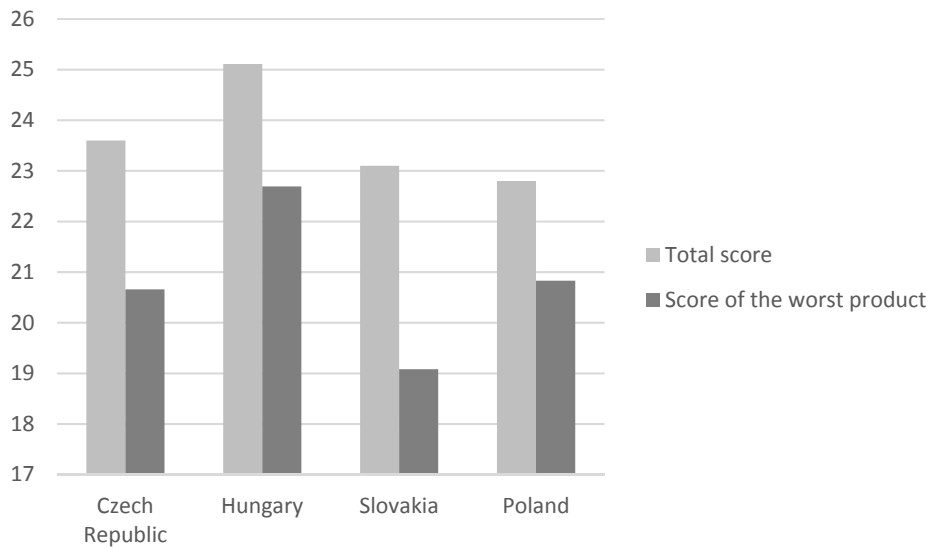


Figure 1.30: Evaluation score of popularity and the worst product according to their place of purchase

6. Conclusion

V4 countries approach the issues of national products labelled as “traditional specialties guaranteed” differently. The most supported and registered are these products in Poland, where there is also the highest number of them from among the V4 countries. Slovakia and the Czech Republic have the same number of meat products registered. Moreover, Slovakia has dairy products registered as well. Hungary has just one traditional speciality guaranteed registered presently. More traditional meat production in Hungary are, however, registered in categories of Protected geographical indication a Protected designation of origin.

The Czech Republic has “Spišské párky”, “Liptovský salám”, “Lovecký salám” and “Špekáčky” registered as TSGs. Products with the TSG logo are manufactured primarily in medium-sized enterprises. Conversely, identical products without the TSG logo are mostly produced in large enterprises and are also more represented in the market network. The Czech Republic has also filed an application for yet another meat product called “Pražská šunka”. Products of “Spišské párky” and “Liptovský salám” are produced in the Czech Republic only in a small extent and “Lovecký salám” with the TSG logo comes mainly from Slovakia. The analysis of composition of products purchased in the Czech Republic showed that the products of “Spišské párky” and “Špekáčky” failed to comply with the applicable Regulations and Czech legislation for these categories. “Pražská šunka” also failed to meet the conditions of composition according to Czech legislation and it is not yet produced according to the traditional recipe of the Regulation. Shop assistants are mainly (74 %) not informed about what TSG mark means. Besides the TSG products, the analysis also included quality of the national traditional product called “Dunajská klobása” which was in conformity with the Czech Decree.

Hungary has one REGISTERED TSG only: “Tepertős pogácsa” (Crackling patty). This product is sold mainly in small bakeries having no TSG logo, in bulk (unpacked). It is manufactured / baked usually in the shop, it is sold in paper or plastic bags after weighing by the shop assistant. The shop assistants are not informed that the Crackling patty is a TSG, except some producers like the PESTI BARNABÁS Specialised Food Industry School. The second Hungarian TSG, the “Rögös túró” (Sweet cheese) is just APPLIED, but not yet REGISTERED in the EU Database. Beside the TSG product of Tepertős pogácsa / Crackling patty in this project, we have analysed the quality of other traditional food (meat)products as well. Some of the PGI and PDO and a national traditional product (not protected). Considering the results, their quality was in conformity with their product specification.

Poland has registered “HONEYs – Czwórniak, Dwójniak, Półtorak, Trójniak”, “Olej rydzowy”, “Pierekaernik”, “Kiełbasa jałowcowa”, “Kiełbasa myśliwska”, and “Kabanos”. From among the meat products, they are primarily sold in small markets having no TSG logos. The quality of national traditional product is the main and sometimes the only support for small entrepreneurs to survive in contemporary market. All the analysed products were slightly inconsistent with the EU Regulation for TSG products, but they were not marked as TSGs. Shop assistants are mainly not informed about what TSG mark means.

Slovakia has “Spišské párky”, “Liptovský salám”, “Lovecký salám”, and “Špekáčky”, “Ovčí hrudkový syr-salašnícky” and “Ovčí salašnícky údený syr” registered as TSGs. Products with the TSG logo are manufactured primarily in medium-sized enterprises. “Liptovský salám” is produced in the lowest amount. “Špekáčky” are originally from the Czech Republic and “Ovčí hrudkový syr-salašnícky” and “Ovčí salašnícky údený syr” are not registered with any producer. In the market network there are available many identical products without the TSG logo, such products are more numerous than those made according to traditional recipes and thus labelled as TSGs. Analyses of products from the Slovak market network showed that “Spišské párky” and “Špekáčky” differed from the prescribed composition and were therefore inconsistent with the existing Regulation. Likewise, “Ovčí hrudkový

syr-salašnický” did not match the pH required in the Regulation, nevertheless, this product was not labelled as TSG.

Production and consumption of traditional national products and TSGs in V4 countries is heavily dependent on the price of products. An associated reason, however, is also low consumer and seller awareness of traditional products and products with the TSG logo. In such a case, wide spreading of basic and advanced knowledge concerning TSG itself and other valuable traditional product throughout the V4 countries is necessary to support our own cultural heritage and to assure work places for micro and small enterprises (where their workers were born). In order to achieve a successful application of these products in the market network, it is also important to reach high quality comparable to the traditional production of the countries. The results of our analyses demonstrate that, primarily with cheaper products, manufacturers often fail to use raw materials permitted or required by the Regulation and produce them in contradiction with the Regulation on TSGs. It is therefore necessary that the supervisory authorities of V4 countries perform more intense inspections also as random inspections in the market network. Information between the V4 inspection authorities is shared via European RASFF and all the V4 supervisory authorities use it. TSG inspections are currently conducted mainly in accordance with the Regulation. Therefore the inspection takes place when registering the producer and then annually in the form of an audit of the registered company. Given the wide range of TSG products and national brands are inspection bodies interested in better dissemination of information targeted at detecting their adulteration. Inspection bodies are also interested to be informed on national protected products within the V4 to protect them in foreign countries.

TSG and national speciality adulteration leads i.a. to different sensory quality of products as indicated by our results. In this case, consumers have a problem to find a product with identical name that should be of equal quality regardless of its manufacturer or production batch. According to market research in the V4 countries, we can recommend to use traditional products registration with name reservation, instead of without name reservation. In the V4 countries, using the registration without name reservation results in producing products without the TSG logo and thus in diverging away from traditional manufacturing or using traditional raw materials. Mainly due to the above reasons, an additional requested for a name reservation was filed for some products. In addition to the use of the European TSG logos, V4 countries have their own quality labels which in varying degrees also define product quality, representation and also the origin of the raw materials used. The amount and degree of product protection varies for individual quality labels, but the possibility of promotion of traditional products may also lie in the promotion of national quality labels within the V4 countries.

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8. Shortcut

CZ – Czech Republic

EU – European Union

HU – Hungary

PDO – protected designation of origin

PGI – protected geographical indication

PL – Poland

SK – Slovak republic

SVA – State Veterinary Administration

MSM – Mechanically separated meat

TSG/TSGs – traditional speciality guaranteed/traditional specialities guaranteed

V4 – country of visegrad grup

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