

Specificity in the processing of Macedonian lamb meat to the member states of the European Union and third countries

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Abstract

Republic of Macedonia is known ground lamb producer and exporter in the Member State of the European Union and in other countries. As a result, the production of lamb meat has specificity in the processing of lambs at slaughter.

Specifications are the results of legislation that prescribes the E.U and each Member State of the Union has its own legislation on production and trade in meat. Traditional most largest importer of our lamb is Italy, imported lamb without head, liver, lungs and heart with an average carcass weight of 8 to 11 kg, while Greece's second lamb meat imports with head, liver, lungs and heart with carcass weight more than 9.00 kg.

Lambs that are exported to the Former Yugoslav Republics (Serbia, Croatia, Montenegro and Bosnia and Herzegovina) are exported with head, liver, lungs and heart, with different carcass weight.

Keywords: *Lamb, Slaughtering, Carcass weight, European Union.*

1. Introduction

The lamb meat, according to its value is among the first products obtained from sheep [1]. Lambs primarily occur as a product of sheep in the form of livestock and it is the main raw material for the slaughtering industry [2]. The lamb slaughtering, has a seasonal character and it is associated with Christmas, Easter and Labor Day holidays, not only here but also in the countries of the European Union.

Every country, no matter whether it is a member of the European Union or not, requires implementation of certain standards in the process of slaughtering and processing of the lamb. So, the slaughtering of lambs intended for the Member States of the European Union is performed in slaughterhouses specialized for production of sheep and lamb. Slaughterhouses in which lambs are slaughtered for export to the European Union every year are subject to inspections by veterinary inspection of the European Union as well as by the Agency for Food and Veterinary according to the Law for Veterinary, Governmental Gazette of Republic of Macedonia 113/2007 and the Public Health Law 114/2007.

Republic of Macedonia is a famous producer of lamb for the Member States of the European Union. Special interest in the Macedonian lamb shows Italy which is long-known and traditional buyer of the Macedonian lamb. Besides Italy, Greece, Croatia, Bosnia and Herzegovina, Montenegro, Slovenia and occasionally the countries of the nearby east occur as importers of the Macedonian lamb meat.

Each Member State of the European Union sets its own requirements that the export abattoir and exporter of lamb meat should meet, and they are different for different countries. As a result of these requirements set by the countries that import lamb meat there is a need to be familiar with the legislation governing the import of the lamb meat in the Member States of the European Union and the separate laws and other legislation of the importing Member State of lamb which should comply with the requirements set in the slaughterhouse of the lambs.

The purpose of those legislations is to protect the health of the consumers and to prevent eventual errors and fraud (true consumer's knowledge), health safety of the food products in the production and trade that is regulated by a number of international and national regulations. The International Food and Agriculture Organization (FAO) and the World Health Organization (WHO) are also concerned with this kind of protection. They have a common program called "Codex alimentarius" (FAO / WHO), which is a set of regulations for food products of the Commission - Codex alimentarius (CAC).

The commission occasionally adopts international recommendations in terms of health safety of food products and meat is included here.

In the Member States of the European Union (EU), for the realization of the common market for food products and in order to remove the restrictions between EU members, the primary EU law applies, which is regulated by Directives of the Council of the European Community for control of food products in the internal market, the principle of mutual recognition applies.

As for the national regulations, the basic requirements for supervision of food products of animal origin are regulated by law, while the objectifying of the technical details for example the details regarding the use of additives or detailed hygiene provisions that are necessary to protect the health of consumers are governed by regulations of the ministries, which provides legal regulations in the field of food products to apply in its principal requirements and grading, the amendments are in line with technical progress and achievement of science and technology in production, processing and trade of food products.

2. Material and method

The research on how the processing of lamb meat intended for export to countries of the European Union and third countries is carried out in industrial slaughterhouse "Gorni Polog" from Gostivar, Republic of Macedonia.

The lambs for slaughtering are purchased from all over the Republic of Macedonia and belong to the domestic types and their mongrels with merino sheep. The live weight of lambs for slaughtering varies from 12 to 25 kg and more.

The purchase of lambs for slaughtering is done by licensed trade organizations dealing with export of lamb in the Member States of the European Union and in third countries.

The slaughtering of the lambs is done according to the requirements of the country importing the lamb. The technology for slaughtering is basically the same as that applied in our country, with some differences that need to be observed during the slaughtering for the concerned country, and they are related to stunning, the weight of the lambs, the carcass weight, the processing, classification and the preparation of the carcasses for cooling, packaging and loading in the transport means.

During the purchase measuring of the live weight of lambs is performed on cattle scales with an accuracy of 0,100 kg. Also, measuring on the live weight of lambs is performed during their unloading at the slaughterhouse on an animal scales with an accuracy of 0,100 kg. Veterinary examination of the lambs is also performed, and then, they are placed in a cattle depot in the slaughterhouse.

The slaughtering is performed in a modern slaughterhouse authorized for lamb export that is in the industrial slaughterhouse "Gorni Polog". The processing of the carcasses is in a vertical position, method which is now applied in all slaughterhouses in the world.

3. Results and discussion

Most of the produced meat is lamb, and a small part is meat from adult sheep. The largest part of the lamb meat produced in the Republic of Macedonia is exported to Italy, Greece, Croatia, Serbia, Montenegro and Bosnia and Herzegovina. The number of lambs slaughtered and exported from the Republic of Macedonia to other countries in 2009 can be seen from the data given in Table 1.

Table 1: Number of slaughtered and exported lambs in 2009

Exported countries	Number of slaughtered lambs	Total meat production (kg)	Average weight of the carcasses (kg)
Italy	164.965	1.419.581	8.605
Greece	109.391	1.218.751	11.141
Croatia	20.545	227.013	11.049
Serbia	3.413	49.647	11.511
Bosnia and Herzegovina	430	5.323	12.379
Total	298.744	2.920.252	9.775

As seen from the data presented in Table 1, in 2009, 298.744 lambs are slaughtered and exported and 2.920.252 kg of meat is obtained. Most of the slaughtered lambs, 164.965 lambs, are exported to the Italian market from which 1.419.581 kg of meat is obtained. The average weight of the cooled carcasses from the slaughtered lambs exported to Italy is 8.605 kg.

The second major importer of our lambs in Greece to which 109.391 lambs or 1.218.751 kg with an average weight of the cooled carcasses of 11.141 kg are exported. 20.545 or 227.013 kg of lamb meat are exported to Croatia, 3.413 lambs and 49.647 kg of lamb meat to Serbia and 430 lambs and 5.323 kg of meat are exported to Bosnia and Herzegovina.

The data presented in Table 1 clearly shows that the average weight of the carcasses from the slaughtered and exported lamb is lowest among the lambs that are exported to Italy, and in the other countries, the average weight of cooled lamb carcass is over 11.049 to 12.379 kg.

Table 2: Number of slaughtered and exported lambs in 2010

Exported countries	Number of slaughtered lambs	Total meat production (kg)	Average weight of the carcasses(kg)
Italy	142.331	1.162.519	8.168
Greece	88.061	949.389	10.781
Croatia	30.056	293.399	9.762
Serbia	1.086	14.648	13.488
Total	261.534	2.419.635	9.252

In 2010, 261.534 lambs or 2.419.635 kg lamb meat are slaughtered and exported for the European countries, which is 37.240 less slaughtered lambs and 500.617 kg less exported meat. There is reduced export of lamb to Italy for 22.634 or 257.062 kg lamb meat. In the same year, in Greece are exported fewer lambs in relation to 2009 for 21.330 or less lamb meat for 169.362 kg. However, in Croatia there is an increase in the number of slaughtered for exported lambs for 9.711 and more meat for 76.386 kg.

The data presented in Table 2 shows that the average weight of the cooling carcasses from the slaughtered lambs which are exported to Italy are characterized by an average slaughter weight of 8.168 kg, while in other countries importing lamb they weight more.

During 2011, the total number of slaughtered lambs decreased, and the decrease was reflected in all countries that traditionally import lamb meat.

Table 3: Number of slaughtered and exported lambs in 2011

Exported countries	Number of slaughtered lambs	Total meat production (kg)	Average weight of the carcasses(kg)
Italy	204.112	1.846.363	9.045
Greece	64.088	707251	11.035
Croatia	44.236	466.830	10.540
Serbia	1.563	23.333	14.928
Montenegro	930	12.260	13.180
Total	314.929	3.056037	9.703

The number of exported lambs during 2011 can be seen in Table 3 which shows the number of slaughtered and exported lambs in the traditional buyers of lamb meat. From the presented data in Table 3 it can be seen that there is a significant increase in the total number of slaughtered and exported lambs and in the meat sold to the countries importing our lamb. In comparison to 2010 more lambs are slaughtered for 53.395 or in meat that number is 2.389.105 kg. As a result of the increased number of slaughtered lambs there is a significant increase in the number of lambs in Italy compared to 2010 for 61. 701 lambs and 683. 844 kg meat. In Greece, by the number of imported slaughtered lambs, there is a decrease in the export compared to 2010 for 23. 973 lambs and 242.138 kg meat. We assume that the reduced export of lamb meat in Greece is a result of the economic crisis in the country. Croatia is more and more interested in importing our lamb and as a result there is a constant increase of the export to that country. In 2011, a total of 44.263 lambs are exported or more for 14.207 lambs and 173. 431 kg of lamb meat.

In 2011, Montenegro occurs as an importer of our lamb where 930 lambs or 12.260 kg meat are exported.

The data presented in Table 2, 3 and 4 clearly shows that the average weight of the lamb carcasses exported to Italy weight less, which is about 9 kg. The reasons for such a small mass of the carcasses of the slaughtered lambs is a result of the habits of the Italian consumers, also a result of the specifics in processing the lamb carcasses.

3.1 Processing of the carcasses of the lambs slaughtered for the Italian market

Italy has traditionally been the largest importer of lambs from the Republic of Macedonia. The largest number of slaughtered and exported lambs is during Easter, and a small number of lambs are exported for Christmas.

The lambs intended for slaughter and their meat is for the Italian market are required to be with a mass of 15 and not heavier than 20 kg, that is the mass of processed carcass not to be more than 12.00 kg. The lambs should not be too obese, with a thick layer of subcutaneous fat or large deposits of abdominal fat. It is best to be fattened with small curvature of the spine. Such features have domestic lambs Pramenka reared in smaller sheep farms and with no intensive fattening.

The technology for production, that is for slaughtering of the lambs intended for the Italian market is not very different from that applied in the slaughtering of lambs for the domestic market. The Italian market requires strict adherence to the requirements of humanization of bleeding that is every lamb should be stunned. When processing the carcasses the front legs are placed in cut in the part of the neck. If the lambs are intended for the Italian market the head is cut off and for other importing countries a plastic bag is placed on the head, the tissue is placed in a separate plastic bag in the abdominal cavity or it is spread in the area of the cross. The lungs, heart and liver remain in the chest and abdominal cavity, as well as the kidneys and the abdominal fat remain on the body.



Fig 1 Lambs Carcasses for Italian market

The carcass processed in this way, weighs from 6 to 12 kg, or the weight of the carcass for export to Italy is 49.5%. After processing the carcasses of the slaughtered lambs are cooled. The cooling temperature should be from 0 to 4 °C, and it is done when the temperature in the deepest layers is under 6 °C.

3.2 Processing of the carcasses of the lambs slaughtered for the Greek market

Greece is the second largest importer of lamb from the Republic of Macedonia. The largest amounts of exported lamb for the Greek market are before the Easter holidays, because it is their tradition to have lamb meat on the table during Easter.

The technology for slaughtering of lambs intended for the Greek market is no different from that applicable to the Italian market, as both countries are members of the European Union, and the differences are related to the

weight of the processed carcasses. The Greek market requires lamb carcasses with more weight that ranges from 22 to 26 kg, that is the average weight of the slaughtered and processed carcasses with head is over 12 kg.



Fig 1 Lambs Carcasses for Greek market

The processed lamb carcasses exported to Greece are with head, internal organs (liver, lungs and heart), kidney and renal fat. The intestines of the slaughtered lambs at the request of the importer are cleaned, washed and placed in polyethylene bags and are packed separately in cardboard boxes (plastic crates), then they are cooled and exported.

3.3 Processing of the carcasses of the lambs slaughtered for the Croatian market

Croatia, in recent years, is increasingly importing more of our Macedonian lamb which is best seen from Tab. 1, 2 and 3 where in 2009 20.545 lambs are exported and in the next 2010 that number increased to 30.056 lambs and in 2011, 44.263 lambs or in weight 707.251 kg and thus came closer to the second traditional importer of lamb - Greece. The largest import of lamb in Croatia is for Easter and Christmas, but lamb is also exported to Croatia after Easter

holidays and most buyers are from the coast that supplies the tourist places with lamb.

The technology of slaughtering and processing of the carcasses for the Croatian market is no different from that applicable in our country. The Croatian market requires bigger lamb whose carcass weights above 12 kg that is the carcasses on the Croatian market are sold with head, lungs and heart, liver, a tissue that is placed on the dorsal part of the body of slaughtered lambs.

3.4 Processing of the carcasses of the lambs slaughtered for other countries

In recent years, Bosnia and Herzegovina, Serbia and Montenegro appear as importers of our Macedonian lamb. The amount of exported lamb in these countries is quite variable, i.e they appear as occasional importers. So, Serbia in the last three years is constant importer of lamb and the amounts are significantly small that range from 20 to 50 tons, while Bosnia and Herzegovina and Montenegro occasionally occur as importers and the quantity of lamb meat exported to these countries is from 5 to 12 tons, but in the following period a greater demand for lamb is expected from these countries.

The technology for slaughtering and processing of carcasses of the slaughtered lambs is the same as that applicable to our market. The lamb carcasses in these countries are exported and sold on their markets with head, lungs, heart, a liver, a tissue that is placed on the back of the carcass of the lambs

4. Conclusions

Based on the examination of the specifics of the processing of lamb for the Member States of the European Union and third countries we can make the following conclusions:

The lambs intended for slaughtering should be healthy, without any appearance of disease or other physical injuries;

After the arrival at the slaughterhouse's depot the lambs need to rest at least 6 hours before slaughtering;

When the lambs are slaughtered, stunning is mandatory in order to ensure the request for the welfare of the lambs;

When skinning the lamb it is forbidden to supply air under the skin because in this way there is additional contamination of carcasses with microorganisms that are

present in the air and there is a break of the cutis and in that way the quality of the skins deteriorates;

The processing of carcasses of slaughtered lambs is different for each importing country, whether a member of the European Union or not;

The lambs that are exported on the Italian market are exported without head, with liver, lungs and heart with an average slaughter weight of 8 to 12 kg;

The lambs intended for the Greek market are exported with head, liver, lungs and heart with slaughter weight greater than 9.00 kg;

The lambs that are exported to the former Yugoslav republics (Serbia, Croatia, Montenegro and Bosnia and Herzegovina) are exported with head, liver, lungs and heart, with different weight.

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