

Turkey's animal selection and animal importation within the scopes of health and technical criteria

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Abstract

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Nowadays, a pandemic has spread all over the world, it is clearly understood how big potential threats are to public health of diseases transmitted from animals to humans. Turkey is imported breeding animal and butchery cattle from different countries to meet their needs. On the other hand, animal import and animal movements have the potential to carry animal diseases to importing countries. Therefore, the animals to be imported must be of good quality and free from diseases. For this purpose, animals are selected within the scope of the WTO SPS agreement in the exporting country. There is a general belief that animal diseases came to Turkey through imports, and adaptation problems were seen due to imported animals don't meet the technical requirements. In this study, has aimed to test this hypothesis. Moreover, Turkey's policies of animal importation, the import process, applications, and especially animal selection processes were examined, the problems identified, and solutions are presented. In this context, besides literature reviews, primary data were obtained from two expert groups who selected heifer and butchery cattle through questionnaires.

Basic statistical analyzes were made with the data obtained, and whether the difference between opinions of the two expert groups was significant or not was subjected to the Chi-square test. It was seen that the views of the two groups were different from each other on some issues, and this difference was found to be statistically significant in the Chi-square tests. According to the findings obtained as a result of the research, recommendations were presented to decision-makers.

Keywords: animal import; heifer; butchery cattle; disease and zoonosis; animal selection

Introduction

Within the framework of The World Trade Organization (WTO) rules, the United State of America (USA) and European Union (EU) countries consistently support livestock breeding with various measures such as financial, insurance, price support, to ensure the development of animal husbandry (Wang et al., 2018). Developing countries, on the other hand, cannot provide the needed support to agriculture and animal husbandry due to a lack of resources. Lack of support for animal husbandry in the long term obliges these countries to import livestock or animal products. On the other side,

Studies show that the real exchange rate and the income level of importers affect the import demand for livestock and animal products (Maleki and Mirzaei, 2012). Turkey, since the 1930s, to improve the genetics of the local breed high-yield dairy cows, and since the 1990s to meet the meat needs butchery cattle were imported (Yavuz and Zulauf, 2004). Turkey applies a maximum of 135% customs duty in butchery cattle import and 225% customs duty in carcass meat import within the framework of the commitments given to the World Trade Organization (WTO 1994/a).

The WTO Sanitary and Phytosanitary Agreement (SPS) gives member states the right to take measures, to ensure

food security, to protect people, animals, and plants from diseases and pests, and prevent the entry of diseases and pests into the country (Leslie and Upton, 1999; WTO 1994/b). However, this right and the policies applied in connection with it may cause the animal and animal product trade to decrease or stop from time to time (Walton, 2000).

The Ministry of Agriculture and Forestry (MoAF) determines the countries where it will import animals, taking into account the recommendations of the World Animal Health Organization (OIE) and the prevalence of animal diseases (OIE, 2020). The up-to-date other information and documents regarding the countries from which the animals can be imported can be accessed on the website of MoAF (MoAF, 2020/b).

MoAF, on behalf of the government in Turkey, is authorized for imports of animals and animal products (Official Journal 2010, 2011, 2019). MoAF uses this authority by "import permit, animal selection in the exporting country, border controls and post-import quarantine" by making four-step control. In the first stage, it allows for the suitability of the country of origin for import. Later, experts (veterinarians and agricultural engineers) are assigned by MoAF for animal selection. In the third stage, the customs gate control is made at the entrance of live animals or animal products to the country, and in the last stage, the animals are kept in domestic quarantine to check whether they carry epidemic diseases.

In the second step of these controls, if the animals are selected to the extent required by the technical and health specifications, the next stages become easier and the import reaches the purpose. If sufficient selection is not made due to various problems at this stage, the problems cannot be solved at other stages and problematic animals can enter the country. However, there are deep concerns in the public about according to the technical requirements of the animals could not be selected, or adequate control could not be done by experts, accordingly many diseases-parasite could enter the country. The news and comments published in the national press about "blue tongue from France, Greece, and Bulgaria, scrapie, and cattle pasteuriosis from Romania and anthrax from Brazil and the ministry have started an investigation" also increase these concerns (Yıldırım, 2018).

In this research, primarily a review of live animal imports, policies, the import process, examine the implementation of the experts, and to be tested the conviction that came by the import of animal diseases are aimed. For this purpose, data were obtained by questionnaires with experts who chose animals for import. This research is one of the rare studies that shed light on current problems and offer suggestions to decision-makers.

Material and Method

Data Collecting

In the research, firstly the literature was reviewed on animal importation and national and international institutional registers were used. Primary data also were obtained through a questionnaire from experts sent by the Ministry of Agriculture for animal selection. In this context, The Simple Random Sampling Method, which is used when the number of members in the population is known, was used in the sampling for the questionnaires to be applied, and the formula was used in this study (Vera et al., 2010). $n = N \frac{z^2 pq}{d^2 (N-1) + z^2 PQ}$.

According to the purpose of the study, the list of experts belonging to the 2010-2016 period was obtained from the MoAF. The number of experts sent to animal selection was determined as 2.672, and sampling was made using these data. Within the scope of the study, it was calculated that 208 questionnaires should be applied with a 99% confidence interval and a 5% margin of error. The experts to be surveyed were selected using the Simple Random Distribution Table over the ongoing expert's list and sent to sufficient experts electronically.

Data Analysis

In the analysis of the data obtained from the experts, primarily proportional values, arithmetic means, and descriptive statistical analyzes were made. Then, the expert opinions were divided into two groups, heifer selection experts and butchery cattle selection experts, since the technical specifications were different. Chi-square analysis was also conducted to determine whether there was a difference between the views of the two groups. It was tested whether the difference between the opinions was statistically significant or not. When the difference between the opinions was found to be significant, different suggestions were made for the problems considering the differentiation of the problems in both groups. When the difference is not important, considering that both groups share the same opinion, the same suggestions are presented for a solution.

Results and Discussion

Animal importation

MoAF aims to develop livestock breeding, to provide products to meet the meat needs of the people, and to meet the breeding heifer needs of livestock holdings. Breeding heifer import is divided into pregnant heifers and young heifers. Animal holdings in Turkey are importing pregnant heifers in general. However, as the stress and other risks that occur in animals during transportation cause the loss of off-

spring, especially some investors have turned to the importation of young heifers.

When there is not enough meat production in the country, the import is made in three ways as cattle for slaughter, fattening calves, or carcass meat. The most common of these is the import of cattle for slaughter. Carcass importation is not preferred in non-emergency situations. In recent years, the import of fattening calves has come to the fore to meet the needs of fattening holdings.

Workflow processes, criteria, and experts

The animal import process from abroad consists of four basic stages. These are; 1) To provide the necessary information, documents, and commitments to the Ministry of Agriculture and to obtain import permission, 2) Obtaining pedigree and health certificates from exporting countries, 3) Animal welfare and customs controls and animal transport, 4) Domestic quarantine and delivery of animals to the breeder (MoAF, 2020/a).

Technical criteria for breeding heifers to be imported; pedigree and ear tag, 6 500-8 000 kg/lactation average milk yield, 4-15 months non-pregnant heifers, 125-400 kg weight, pregnant heifers 3-7 months gestational age, 13-20 months insemination age and 425-650 kg weight, healthy appearance, fertile phenotypic traits. It is also important that there are no pathological problems such as lameness, blindness, tumor, abscess, eye, skin disease, or physical and orthopedic defects such as breast discomfort. The age of fattening young calves should not exceed 12 months, and not have physical defects such as blindness and lameness (MoAF, 2020/b).

Two experts are appointed to select the animals that have been granted permission to import by the Ministry of Agriculture in the exporting country. The expert team consists of a veterinarian and an agricultural engineer. Travel and other expenses of the assigned experts are covered by the importing company. Experts make a selection by considering the criteria given in the technical and health specifications determined by the MoAF. Taking into account any accident or force majeure, animals are selected 20% more than the amount allowed for import by the Ministry. Live animals not included in the selection list prepared by experts are not allowed to enter the country (Güngör&Zülkadir, 2019).

Shipping, and customs controls

After the animals are selected for breeding animal import, blood tests are performed against diseases such as Tuberculosis, Brucella, IBR/IPV, Enzootic Bovine Leucosis. The animals that do not have these diseases are shipped. The list of these animals is sent to the related customs directorates by the MoAF for entry permission.

According to information received from MoAF experts and technical specifications, Turkey sees enough animal health notifications from exporting countries and does not control internal parasites in animal imports.

Shipping is one of the stress factors that farm animals are exposed to. Changing external conditions during transport may expose farm animals to physical, physiological, and psychological stimuli. Therefore, shipping is accepted as a cause of discomfort and stress in animal husbandry (Brandshaw et al., 1996). It has been understood that during the transportation process, EU rules such as area per animal, ventilation, breaks, and similar required by animal welfare are applied by shipping companies.

In a study conducted in Russia, it was found that the intramuscular injection of 10 ml of PS-7 and Prevention-N-C biological products in imported heifers seven days before and two days after transportation reduced transport stress and activated their protective mechanisms (Semenov, 2020). However, it is understood that any biological product application is not made to reduce the stress on the shipping of animals by Turkish importers.

The importing companies are obliged to have all vaccinations and blood analyzes of the animals during the 21-day domestic quarantine period. In quarantine, 3% of the animals are tested for disease, if positive, all animals are tested. Sick animals are not allowed to enter the country. However, the general practice is to destroy and bury sick animals instead of returning them to the exporting country. After the domestic quarantine process is over, animals are delivered to breeders or investors. Farmers/investors who buy breeding animals register with the animal registration system. Provincial directorates of agriculture carry out domestic quarantine, registration, monitoring, and control of imported animals (MoAF, 2020/b).

Import quantities and countries

The population and income growth in Turkey have caused an increase in the demand for meat products in the 2000s. The government allowed animal imports to stop the rise in red meat prices in 2010. However, red meat imports could not stop the price increases; on the contrary, it caused a decrease in domestic supply (Üstüner et al., 2017). Although the amount of meat import was limited in 2012, 2013, and 2014, as of 2015, the import of cattle for slaughter was allowed again (TurkStat, 2020). Turkey, in 2018 by 1.3 million head of cattle imported after the United States became the second-largest importer in the world (Euromeatnews, 2020).

Turkey imported 3 897 000 butchery cattle (HS code 010229) 2010-2019 periods. 64.3% of this import was made from South America, 30.7% from European Union countries, and 5% from Australia (Figure 1).

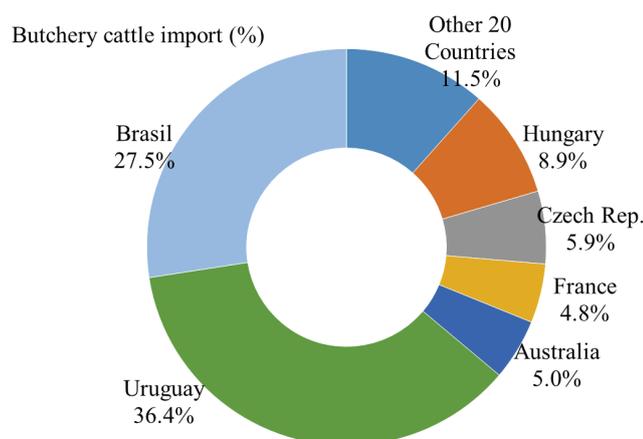


Fig. 1. Turkey's import of cattle for slaughter between 2010 and 2019 (%)

Turkey imported 460 800 heifers (HS Code 010221) from 20 countries in the same period. It was imported 20.8% from Germany, 19.7% from Austria, 14.6% from the USA, and 11.6% from the Czech Republic of these imports (Turk-Stat, 2020) (Figure 2).

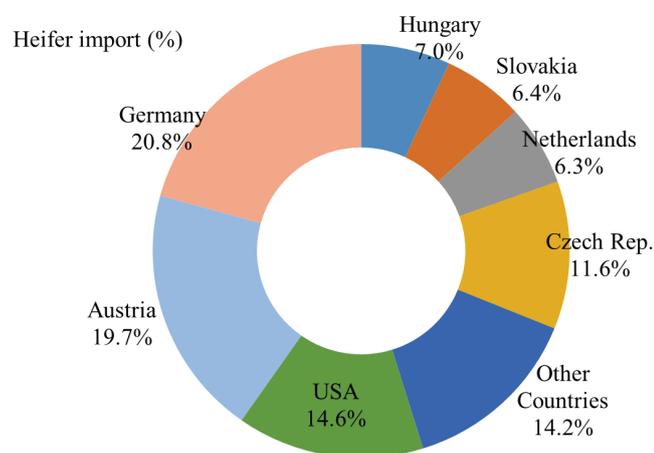


Fig. 2. Turkey's heifer import between 2010 and 2019 (%)

The Turkey governments manage the import of butchery cattle by opening a tariff quota from time to time and reducing customs duties with the decision of the Council of Ministers. It has reduced the customs tax rates from 135% in butchery cattle imports to 40% in 2010 and 26% after 2017. Custom duty rates for butchery cattle import by the Meat and Milk Enterprises are applied as 0% within the scope of the tariff quota. Turkey has also applied customs duty rates of 0% for imports of breeding heifers for many years.

Animal health management

Animal health management, central government, regional, provincial/district organizations, and universities within a country should work in collaboration. Disease prevention activities should start before the disease enters the country, diseases should be monitored internationally, and animals should be tested at customs gates. Pre-boarding inspection should be carried out to prevent sick animals from entering the country. Exporting countries must meet the health requirements of the importing country and submit certified official documents. Veterinarians should quarantine animals after inspection at the checkpoint. Such practices reduce the likelihood of infected animals entering a country. These activities will assist in the protection of livestock and human health, and will also promote livestock trade (Torres *et al.*, 2002).

Turkey after 2007 to combat animal diseases; has implemented the food, feed, and veterinary legislation under the EU legislation, established border checkpoints, determined their responsibilities, improved laboratories, established identification and recording systems of sheep and goats, started to register animal movements and slaughter, and Thrace region was made free from foot and mouth disease. Turkey also, taking into account that a very contagious disease of animals by animal trafficking come from neighboring countries, especially along the border have increased their measures. On the other hand, vaccination against animal diseases, quarantine in disease outbreaks, and compensation for culled animals continue. In the last 10 years, an average of USD 23 million has been allocated to the Ministry of Agriculture from the budget to combat animal diseases and parasites, excluding salaries (Sbb, 2020).

Ministry of Health (MoH), MOAF, and Universities have prepared Turkey's Zoonotic Diseases Action Plan (2019-2023). Plan, reducing the prevalence of zoonotic diseases in Turkey is intended to improve the community's quality of life. The plan aims to raise awareness of the society about zoonotic diseases and their prevention, to make risk analyzes and to identify threats, to develop diagnostic laboratories, to monitor, evaluate, coordinate and plan (MoH, 2019).

Animal disease and public health

The close relationship between humans and animals is due to the food and economic dependence of humans on animals, as well as the potential for transmission of animal diseases to humans. (Kaoud, 2015). Animal diseases can have a significant impact on the livestock sector of any country. An example is the experience of the UK and EU countries with bovine spongiform encephalopathy (BSE). The cost of this disease to the UK economy has been calculated as 3 billion

dollars. The USA stopped importing ruminant animals from the UK in the late 1980s and from all European countries in 1997. In addition to the health and economic effects of the disease, it also had important political effects on England (Walton, 2000).

Animal trade and movements create ideal conditions for pathogens to multiply. The coexistence of animal populations, especially sick animals, in collection centers, during transport, or in markets lead to the spread of pathogens. The most important measure to be taken to reduce animal diseases is to monitor animal shipment. However, these measures do not benefit when import amounts exceed controllable amounts (Akhtar, 2012)

In a study, carried out on heifers imported by the Czech Republic from France, Denmark, and Germany, It has been determined that were 91.2-100 % of endoparasites, 58.8-92.8% of protozoa parasites, and 72.5-80.8 % of gastrointestinal nematodes (Pavlašek, 1995). In a study also conducted in Poland, *Eimeria* protozoan was found to be 17.9%, cryptosporidium species 11.3%, and gastrointestinal nematodes 55.6% in heifers imported from the Netherlands (Pilarczyk et.al. 2009).

The OIE has published a guide for animal disease control. The guide provides guidance and methods for member countries on the objectives, targets, planning, implementation, research, monitoring, and evaluation of control programs (OIE, 2014).

Animal diseases transmitted from animals to humans and requested from countries to report are determined by the OIE. Turkey has reported to OIE of 107 zoonotic diseases so far. Even today, brucellosis, echinococcosis, leishmaniosis, Crimean Congo, toxoplasmosis, tularemia, and such

anthrax, continue the presence of certain zoonotic diseases in Turkey (MoH, 2019). The most animal disease notified to OIE by Turkey is brucellosis. The number of brucellosis notifications made in the last ten years varies between 4 173 and 10 244 (OIE, 2020). The most common animal diseases in humans except brucellosis are seen in Figure 3.

In recent years, many new infections began to pose a threat to livestock holdings in Turkey. This is since vector-borne factors other than the diseases that are not notified mandatory in the animal import are not examined (Özgür, 2015).

Animal selection experts have been sent to the exporting countries depending on the control (permit) documents in import. Key issues such as the difficulties experienced by experts who went abroad for animal selection and their opinions about the issue were examined in this section of the research. In this context, it was understood that 43.7% of those who participated in the questionnaire worked in MoAF central organization and 56.3% of them worked in provincial directorates.

It was determined that those who participated in the questionnaire were in the age range of 22-64 and were 44.0 years old on average, and 11.8% of them were female, and 88.2% of them were male. It was seen that a total of 79.8% of those who participated in the questionnaire were Veterinarians and 20.2% of them were agriculture engineers and those with experiences in the range of 11-20 years formed the largest group by 48.7%.

In the research, the ratio of those who think professional experience is required in animal selection was calculated as 89.6% on average. Regarding the duration of professional experience needed, while 33.3%, the largest group, of those

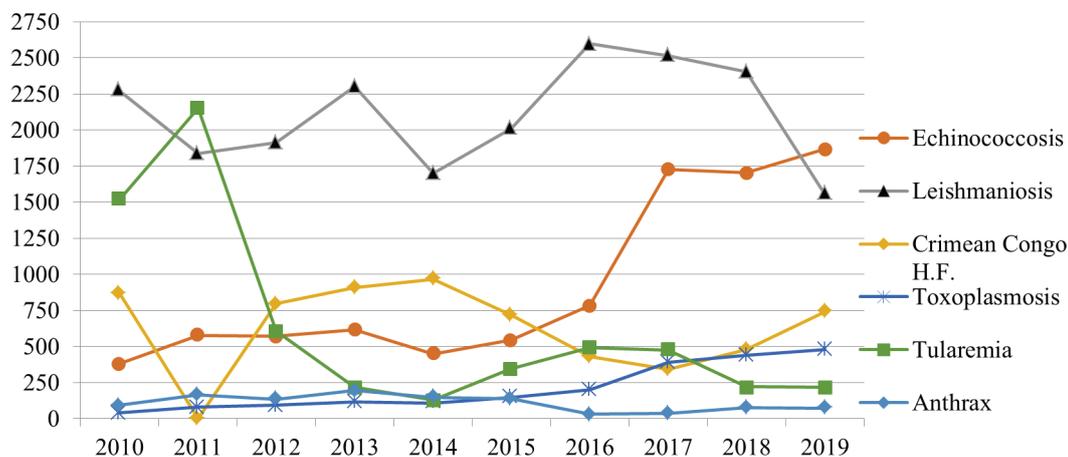


Fig.3. Most reported animal diseases in humans from Turkey to OIE between 2010-2019, except for brucellosis

who went to heifer selection found 10 years of experience to be sufficient, 35.9% of those who went to butchery cattle selection found 3 years of experience to be sufficient.

It was understood in the study that 75.9% of those who went to heifer selection and 69.2% of those who went to butchery cattle selection received training on the issue before going to work. Findings concerning the countries to which those who participated in the questionnaire went for animal selection, and animal defections and diseases encountered in these countries are given in Table 1.

According to the distribution of defects encountered in animal selection by country, Germany is the country where breast and foot defects, as well as fungus, papilloma, and parasitism, are most common. Hungary is seen as the country where the defect/disease types are most frequently encountered. Taking these risks into consideration while assigning selection experts will contribute to the effectiveness of the selection and achieving the importation purpose.

In the study, it was found that butchery cattle selection was mostly (62.7%) from collection facilities or at most 10 farms and more than half of the heifer selection (56.6%) was made from at least 20 farms. From here, it is understood that assignment should be made considering that the selection of

heifers is generally made from farms.

When the population sizes shown to the experts were examined, it was understood that they selected an average of 400 heifers (40%) among 1000 cattle. It is understood that an average of 50 heifers and 150 butchery cattle can be selected per day by conducting adequate technical and health checks by experts. It is seen that the rate of selection from the collection facilities is lower in the selection for heifers and higher in the butchery cattle selection.

Findings regarding the most common defects and diseases encountered by animal selection experts are given in Table 2.

The most frequent elimination reasons in heifer selection are pedigree and pregnancy records by 25.1%, mammary defections by 22.5%, feet/nail defections by 14.7%, and other reasons. The elimination reasons in butchery cattle selection were also determined to be non-compliances with technical specifications by 23.1%, age by 17.2%, and breed features and health problems by 10.3%, respectively. These reasons were evaluated as general reasons that can be easily determined by Veterinarians of the importer companies. Therefore, the assignment of an official veterinarian for butchery cattle selection is not regarded as significant.

Table 1. Distribution of the countries from which animals were selected and the defections and diseases encountered according to countries

%	Germany	Austria	Czech Republic	Hungary	France	Other Countries
Mammary defections	49.0	25.0	10.0		6.0	10.0
Feet/nail defections	44.0	17.0	15.0	12.0	2.0	10.0
Fungus	33.0	17.0	17.0	17.0	8.0	8.0
Papilloma	40.0			40.0		20.0
Parasitism	33.0			33.0		33.0
Pneumonia			25.0	25.0		50.0
Cachexia					67.0	33.0
Trichophytosis				25.0		75.0
Respiratory disorder		20.0		60.0		20.0
General health problems		8.0	17.0	33.0	25.0	17.0

Table 2. Defections and problems encountered in heifer and butchery cattle selections

Physicdefections encountered in heifer selection (%)			Physic defections encountered in butchery cattle selection (%)		
1	Pedigree data/pregnancy date	25.1	1	Non-compliances with technical specifications	23.1
2	Mammary defections	22.5	2	Age / Young	17.2
3	Feet defections	14.7	3	Breed feature / Genetic structure	10.3
4	Physical structure / General Condition	12.6	4	General Health (arthritis / respiratory)	10.3
5	Breed features / Hybridity	5.2	5	Physical defections/ Disabled / Lamé / Injured / Missing Organ	4.8
6	Age and Weight	6.5	6	Papilloma / Parasitism / Cachexia / Pneumonia	4.5
7	Health / Fungus	3.9	7	Morphology / General condition / Performance	2.4
8	Morphological deformation	1.3	8	Records	0.7
9	No answer	8.4	9	No answer	26.7

The differences between the views of both expert groups on other issues and the statistical evaluation of these differences are given below. At least one expert should be experienced according to 94.1% of the experts assigned to the selection of heifers and 70.9% of the experts assigned to the selection of butchery cattle. The difference of opinion between the two groups was found to be statistically significant ($p < 0.05$). Accordingly, the ministry should appoint at least one experienced expert in the selection of heifers. According to 53.6% of experts assigned for the selection of heifers and 61.2% of experts assigned for the selection of butchery cattle, the term of office is not sufficient. The difference between the answers of the two groups was not found statistically significant ($p > 0.05$). However, the term of office of those sent to heifer selection by the ministry should be extended.

In the study, 52% of the experts assigned to the selection of heifers and 44.6% of those assigned for the selection of butchery cattle did not agree with the opinion that an expert should be assigned from the relevant provincial directorates. The difference between the groups was not statistically significant ($p > 0.05$). According to this result, the practices of the ministry were found to be suitable. It is understood that 45.7% of the experts assigned for the selected heifers and 24.2% of those assigned for the selected butchery cattle do not agree with the opinion that the companies offer a sufficient number of alternative animals to the experts. This difference was calculated as statistically significant ($p < 0.05$). It is understood from these results that sufficient alternative heifers are not shown to the experts. According to this result, the Ministry should warn the importing companies to show the experts sufficient alternative heifers in the selection of heifers.

According to 48.2% of experts assigned for heifer selection and 21.4% of those assigned for butchery cattle selection, non-certified animals are also offered to experts. In the analysis, the difference between the answers of the two groups was found to be statistically significant ($p < 0.05$). These results show that exporting companies do not fully provide the required documents. The Ministry should notify importing firms to present their certificates and pedigree records to experts in advance at the beginning.

On the subject of adequate technical and health controls; according to 74.4% of experts who heifers select and 88.3% of those who butchery cattle select, these controls were adequately performed. The difference between the answers of both groups was not statistically significant ($p > 0.05$). However, more opportunities should be provided for technical and health examinations, especially for experts involved in the selection of heifers.

About adaptation problems after import; According to 84.5% of experts who chose heifers and 87.2% of experts who chose cattle for butchering, the reason for these problems was not the selection of animals, but the care and feeding conditions in smallholdings. There was no statistically significant difference between the views of the two groups of experts ($p > 0.05$). Accordingly, it can be said that the reason for the adaptation problem in smallholdings rather than large holdings is the maintenance-feeding conditions

Conclusion

Within the scope of OIE recommendations and EU harmonization legislation, it has been understood that legislation, infrastructure, recording, and control studies were developed for the animal health system after 2010. It is understood that experts show the necessary sensitivity for health and technical requirements in animal selection. However, to alleviate concerns and speculation, imports should be spread over time and large quantities of imports should not be allowed at the same time. On the other hand, since imports are uneconomical in periods of the rise of the exchange rate in Turkey animals trafficked from neighboring countries should be stopped.

According to expert opinion, common problems in exporting countries should be taken into account by the Ministry, such as inadequate animal potential, lack of certification, and physical defects of animals. It is recommended that butchery cattle imports should be carried out regularly throughout the year in a way that will not cause price fluctuations in the domestic market, and import permission should only be given to the State Meat and Milk Institution. During import controls, parasite checks should also be carried out. Thus, it will be prevented by new vector-borne diseases entering Turkey. Finally, it is thought that more studies should be done considering the health and economic aspects of the subject.

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References

- Akhtar, A. (2012). Animal Agriculture: Our health and our environment. In: Animals and public health, why treating animals better is critical to human welfare. Palgrave Macmillan, 117-131.

- Brandshaw, R.H., Parrot, R.F., Goode, J.A. & Lloyd, D.M.** (1996). Behavioral and hormonal responses of pigs during transport: effect of mixing and duration of journey. *Animal Science*, 62(3), 547. <https://doi.org/10.1017/S1357729800015095>
- Euomeatnews** (2020). <https://euomeatnews.com/Article-Turkeys-cattle-imports-lifts-enough-to-worry-local-breeders/3178>.
- Güngör, S. & Zulkadir, U.** (2019). Import of pregnant breeding heifers subject to special permission by making a contract with the breeders. *CenRaPS Journal of Social Sciences*, 1 (1), 54-62 (Tr).
- Kaoud, H.** (2015). Zoonotic diseases and public health. Create-space. ISBN: 978-1514645611.
- Leslie, J. & Upton, M.** (1999). The economic implications of greater global trade in livestock and livestock products. *Rev. Sci. Tech.*, 18 (2), 440-457. <http://www.oie.int/doc/ged/D9254.PDF>
- Maleki, B. & Mirzaei, F.** (2012). Efficient components on livestock products export in Iran. *Modern Economy*, 3 (8), 931-938. <https://www.doi.org/10.4236/me.2012.38117>
- MoAF** (2020/a). Registers of the Ministry of Agriculture and Forestry (Tk). <https://www.tarimorman.gov.tr/HAYGEM/Menu/20/Buyukbas-Hayvan-Ithalati>
- MoAF** (2020/b). Control Document Preparation Procedure in Livestock and Animals Material Import. <https://www.tarimorman.gov.tr/Konular/Veteriner-Hizmetleri>
- MoH** (2019). Turkey Zoonotic Diseases Action Plan (2019-2023). Ministry of Health Publication, No: 1130. Ankara. 514 (Tk). ISBN: 978-975-590-718-5 https://vetkontrol.tarimorman.gov.tr/merkez/Belgeler/Zoonotik_Hastaliklar_Eylem_Pani.pdf
- Official Gazette** (13/6/2010). Law No. 5996 on Veterinary Services, Plant Health, Food, and Feed. Number: 27610.
- Official Gazette** (8/6/2011). Legislative Decree No. 639 on Organization and Duties of the Ministry of Food, Agriculture, and Livestock.
- Official Gazette** (27/12/2019). Import Control Communiqué of the Products Subjected to the Control of Ministry of Food, Agriculture and Livestock (Product Safety and Control: 2020/5) 2019.
- OIE** (2014). Guidelines for Animal Disease Control. <https://www.oie.int/scientific-expertise/specific-information-and-recommendations/>.
- OIE** (2020). Country Information, World Animal Health Information Database. http://www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home
- Özgür, S.** (2015). The overlooked danger in dairy farms: Flies. *Tusedad*, January-March, 2015, 12-13 (Tr).
- Pavlásek, I.** (1995). Findings of Cryptosporidia and of other endoparasites in heifers imported into the Czech Republic. *Veterinární Medicína*, 40(10), 333-336.
- Pilarczyk, B., Baliccka-Ramis, A., Kozak, W. & Ramisz, A.** (2009). Occurrence of endoparasites in heifers imported to Poland from the Netherlands. *Archiv Tierzucht*, 52, 265-270. <https://doi.org/10.5194/aab-52-265-2009>
- Sbb** (2020). Strategy and Budget Department (Tk). <https://www.sbb.gov.tr/kamu-yatirim-programlari/>
- Semenov, V., Mudarisov, P., Larionov, G., Tsarevsky, I., Nikitin, D., Simurzina, E. & Ivanova, T.** (2020). Prevention of transport stress in imported heifers improves their health status and their productive parameters. *Earth and Environmental Science*, 433. <https://www.doi.org/10.1088/1755-1315/433/1/012025>
- Torres, A., David, M. J. & Bowman, Q. P.** (2002). Risk management of international trade: emergency preparedness. *Rev. Sci. Tech. Off. Int. Epizootic*, 21 (3), 493-498. <https://doi.org/10.20506/rst.21.3.1344>
- TurkStat** (2020). Turkish Statistical Institute. <https://data.tuik.gov.tr/en/main-category-sub-categories-sub-components2/>
- Üstüner, H., Yalçın, H., Orman, A., Ardiçlı, S., Ekiz, B., Gençoğlu, H. & Kandazoğlu, O.** (2017). Effects of initial fattening age on carcass characteristics and meat quality in Simmental bulls imported from Austria to Turkey. *South African Journal of Animal Science*, 47 (2), 194-201. <https://doi.org/10.4314/sajas.v47i2.11>
- Vera, A.V., Vargas, G.A., Rodríguez, J.A.L., Belem, D. & Ruiz, A.** (2010). Determinación de Costos de Implementación de un Programa de Inocuidad de Nlimón Persa (*Citrus latifolia*, TANAKA), en Veracruz.
- Walton, T.E.** (2000). The impact of diseases on the importation of animals and animal products. *Annals of the New York Academy of Sciences*, 916 (1), 36-40 <https://doi.org/10.1111/j.1749-6632.2000.tb05271.x>
- Wang, X. J., Pan, J. & Hu, J. L.** (2018). US domestic support policy on China-US animal husbandry trade. *American Journal of Industrial and Business Management*, 8, 2275-2287. <https://doi.org/10.4236/ajibm.2018.812152>
- WTO** (1994/a). Turkey's Uruguay round goods schedules, https://www.wto.org/english/thewto_e/countries_e/turkey_e.htm
- WTO** (1994/b). The WTO agreement on the application of sanitary and phytosanitary measures (SPS Agreement). https://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm
- Yavuz, F. & Zulauf, C.R.** (2004). Introducing a new approach to estimating red meat production in Turkey. *Turk J. Vet. Anim. Sci.*, 28, 641-648.
- Yıldırım, A.E.** (2018). Imported animal diseases, *Dünya Newspaper*, 29.08.2018 (Tr).