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Structure of Dairy Cattle Holdings and Market Supply of Milk: The Case of İzmir Province, Turkey*

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Abstract: This study aims to determine the production structure of dairy cattle farms and to investigate the problems related to dairy cattle husbandry and offer solutions to these problems in İzmir province which has an important share in the milk production of the Aegean Region. The main material of the study was obtained from face to face surveys conducted with 102 dairy producers calculated by stratified random sampling in İzmir province in 2014. According to the results, the average number of family members in the farms is 4, and the experience of the producers on dairy cattle farming was average 23 years. The most important issue for farmers in dairy cattle husbandry is the high feed cost and also unstable prices in feed and milk. Moreover, 52.9% of producers stated that the biggest problem in the dairy cattle industry is high feed prices. It is also found that 39.4% of producers sell milk to collectors. The amount of quality roughage should be increased so that the cost of the producer should be reduced and the continuity of production should be ensured.

Keywords: Dairy cattle, milk production, milk marketing, farms, İzmir

1. Introduction

The livestock sector, which is one of the most important branches of agriculture, has a significant share in the economies of developed and developing countries (Uygur, 2015). Milk is a source of the essential nutrients necessary for people to develop a healthy body and support for brain development. Since 91.2% of the world's milk production is obtained from dairy cattle, dairy production occupies an important place in milk production (Tokmak, 2009; Anonymous, 2014).

When Turkey's livestock policies are examined, due to the unstable structures of the policy, the dairy cattle sector has not reached a sufficient size. However, the policies made in the field of dairy cattle in the last decade have become more stable than in the past, and great progress has been made in dairy cattle. Turkey's share of animal production in agriculture comes after crop production. The share of animal production in agriculture is 32.0%, while the proportion of dairy cattle in the livestock is 48.0% in Turkey (Anonymous, 2020a). In some of the European countries such as France, Britain, and Germany, the proportion of animal husbandry in agriculture is quite high compared to Turkey. This rate was 60.0% in France, 70.0% in England, and 75.0% in Germany (Anonymous, 2020b). The reason for the relatively low share of Turkey in these years is due to the decrease in the number of animals until 2017 (Bintaş, 2011; Aras, 2015; Anonymous, 2020a). In the last 20 years, milk production has increased by 138%, although the number of milked animals has increased by only 24% (Anonymous, 2020a). This shows that there is an increase in the yield of dairy cattle in Turkey compared to previous years.

One of the main reasons for livestock production coming after crop production is the tradition of giving priority to crop production in Turkey (Uygur, 2015). The biggest problem of dairy cattle husbandry in the country is the lack of large-scale farms. As a matter of fact, approximately 46% of dairy farms have less than 6

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cattle, while only 0.02% have more than 500 cattle (Anonymous, 2019). Technological inadequacies, poor feeding systems, and rural to urban migration are other important problems (Akbay and Boz, 2005; Topçu, 2008). It is necessary to grow dairy cattle farms in rural areas and to upgrade them from family to commercial enterprises. In this way, migration from rural to urban can be prevented and large-scale farms can be established by using technology. In addition to this, it is important to make various policies not only in terms of farm structure but also in terms of animal existence and yield. Although dairy cattle farming has been carried out with high yielding races in recent years, the desired level of yield is still not obtained (Topçu, 2008; Seki and Biler, 2016; Varışlı and Akyol, 2018).

In terms of livestock numbers, Izmir province is ranked second with 4.67% in Turkey. According to the 2019 Turkish Statistical Institute (TUİK) data, the number of dairy cattle in İzmir was 307276 heads; 86.53% of the total cattle is culture breeds, 10.37% hybrid, and 3.10% indigenous breeds. The first three districts of İzmir with the highest cattle numbers are Ödemiş, Tire, and Kiraz, respectively. As of 2019, İzmir ranked second in Turkey with 1150838 tons of milk production with a share of 5.54%. As of 2019, 91.2% of cow's milk is obtained from culture breeds, 7.8% from hybrid, and 1.0% is obtained from the indigenous breeds (Anonymous, 2020a).

In Turkey, there are significant differences between the regions in terms of the number of dairy cattle, milk production, and production methods. For these reasons, studies carried out on a local or regional basis are important. With this context, Koyubenbe (2005) and Uygur (2015) conducted a study on the situation and the possibility of improvement of dairy cattle farms in İzmir. Boz (2013) and Boz et al. (2011) conducted studies on structure, problems, and adaption of innovation of dairy cattle enterprises in the Eastern Mediterranean Region of Turkey. Oğuz and Yener (2016), and Muradi and Akbay (2018) investigated the structure and marketing opportunities of dairy farms in Konya province. Kılıç and Eryılmaz (2020) conducted a research to investigate structural characteristics of dairy farms in Samsun province while Eryılmaz et al. (2020) evaluated dairy farms in terms of adoption of innovations and sources of information they use in Bafra and Canik districts of Samsun province. Overall, the results of these studies show that dairy farms in Turkey face structural and managerial problems which are mostly caused by external factors such as unstable prices of dairy products in the market as well as high-level costs of inputs, particularly feed.

This study aims to reveal the general situation of dairy cattle farms in İzmir and to identify the problems faced by producers and to offer solutions to these problems. More specifically, the objectives addressed in the study are to determine the socio-demographic characteristics of dairy farms, the structural properties of dairy cattle husbandry, barn types and utilization of animal manure, and the marketing of milk and dairy products.

2. Materials and Methods

The main material of the study consisted of data obtained from the agricultural farms engaged in dairy cattle farming in the districts of İzmir province of Turkey in 2014. While determining these districts, the records of the Breeder Manufacturers Association and the Ministry of Agriculture and Forestry were used. Considering the number of cattle milked in dairy cattle farms, a survey was conducted with the farmers that have five heads and above dairy cattle (Akbay et al., 2015). For İzmir province, surveys were conducted in a total of 26 villages; 11 villages in Ödemiş district, seven villages in Tire district, and eight in Bayındır district, and the number of farms in these villages constituted the main population of the study. The sample size from the main population was determined as 102 by stratified random sampling method.

In the study, demographic characteristics, production, and marketing structures of the dairy farmers were questioned. In addition to these, information was obtained about the most important problems and future expectations of the farmers while breeding livestock. For the study, the data were analyzed using descriptive statistics consisting of frequency, percentage, mean and standard deviation. The important problems encountered by farmers related to dairy cattle farming were analyzed by using the five-point Likert scale. The Likert scale is used to allow the individual to express how much they agree or disagree with a particular statement. The scale developed by Palaz and Boz (2008) was used to interpret the averages in Likert type questions. The response scales use in this study were such as 1= Strongly disagree, 2= Disagree, 3= Somewhat agree, 4= Agree, 5= Strongly agree. The data were analyzed using the SPSS statistical software (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.).

3. Results and Discussion

3.1. Socio-demographic characteristics of farmers

According to survey results, the average age of dairy cattle producers was 47.4 years, and all farmers were found to be literate in the region. It has been determined that 87.3% of the owners are mainly employed in agriculture and animal husbandry and 12.7% work in other jobs. Moreover, 66.7% of farm owners do not have social security. In dairy farmers with a low number of animals, having social security is very low compared to other owners.

The average number of individuals in the family is 4, and 3 of them are dealing with dairy cattle. In smallholder dairy farms, the elders of the house are more interested in dairy cattle than the young ones of the family (Ağır and Akbay, 2018). In addition, although other individuals do the maintenance of the animal from time to time, mostly only one person does it. It is very difficult for a single person to deal with the health and care of animals, and therefore the farmer does not plan to move livestock farming forward.

The experience of farmers in dairy production is 23.1 years, and it is 23.4 years in crop production. It has been determined that large-scale farms in the research area produce livestock and plant production for a longer period than medium and small-scale farms. Moreover, dairy cattle farming and vegetative production periods are very close to each other. The dairy cattle farmers in İzmir province produce plant products to meet also their animal feed needs.

In the region, 45.1% of farm owners are engaged in dairy husbandry for their livelihood, 40.2% are for commercial and 14.7% are for both purposes. As the size of the farms increased, the share of carrying out livestock activities for commercial purposes significantly increased ($P< 0.01$). The majority of the farmers still do not have livestock farming for commercial purposes. Livestock farming in the region comes from farmers' ancestors. Half of the farmers in the researched region stated that they started dairy cattle farming as it was a family job.

3.2. Structural properties of dairy cattle husbandry

While almost all of the farmers (94.1%) are members of the Farmer Registration System, only 5.9% are not members (Table 1). The non-member farms stated that they do not consider it necessary to be a member of the Farmer Registration System because they are members of the Chamber of Agriculture. According to results, 96.4% of farmers participating in the study are members of the Cattle Breeders Association, 28.6% to the Milk Producers Union, 23.3% to the Meat Producers Union, 93.0% to the Chamber of Agriculture, and 19.3% are members of the Agricultural Credit Cooperative.

In the research area, more than half of all the farm groups were found to keep the pedigree record; 27.5% of farmers keep the detailed income expense record of their business while 72.5% of farmers do not keep any record. When asked whether the animals are insured; only 6.3% of farmers insured their animals (Table 1). Most farmers do not insure their animals because of high insurance premiums. Nizam and Armağan (2006), in their study in Aydın province of Turkey, stated that the rate of keeping an animal pedigree record was 47.0% and the rate of keeping a detailed income expense record was 17.0% across all dairy farms, but no farms had animal insurance.

Dairy farmers need to pay attention to hygiene rules on their farms. Especially in dairy animals breast disinfection affects the milk yield of the animal. The nipples used in milking, the tip parts of milking machines, and the cleanliness of the person who follows and cares for milking are very important in this regard. The main reason for the occurrence of mastitis disease, which often occurs in the breasts, is that the disinfection process is not performed. The majority of the producers (94.1%) in the researched region have performed udder cleaning before milking, while 5.9% have been milking without udder cleaning (Table 1). In

Table 1. General information about dairy cattle husbandry on farms (%)

	Yes	No	Total
Membership in the Farmer Registration System (ÇKS)	94.1	5.9	100.0
Keeping a record of the pedigree of animals	70.6	29.4	100.0
Keeping a detailed income and expense record of the farm	27.5	72.5	100.0
Having insurance for animals	2.0	98.0	100.0
Practicing pre-milking teat cleaning	94.1	5.9	100.0
Cows remain infertile throughout the year	71.3	28.7	100.0
Adequacy of the pasture area	98.0	2.0	100.0
Using labor from outside the farm	44.7	55.3	100.0

addition, the animals of the producers who milk without breast cleansing have mastitis disease almost every year (Sailo and Chakraborty, 2012; Baştan, 2017). According to similar studies, all farmers (100.0%) in Edirne (Önal and Özder, 2008) and 96.0% of farmers in Tekirdağ (Soyak et al., 2007) performed nipple cleansing before milking. It has been observed that most producers in the region wash the nipple before milking, then dry it, and proceed to milking. Mastic disease in the region is less common in farms where teat cleaning is performed. All farmers should be ensured to do teat cleaning before milking. The technicians assigned by the Agricultural Directorates to the farmers, at certain times of the year, should provide training on animal cleaning, udder cleaning before milking, and cleaning of milk machines. In this way, animal diseases can be prevented in the region.

When the milking type of the farms is analyzed, the majority of the producers (83.2%) prefer a single system, 14.9% in the pipeline milking parlor and 2.0% of them prefer the milking system in the form of a room (Table 2). The producers in the region are quite knowledgeable about milking systems. Farmers need to use the machine system in terms of milking, saving time, and hygiene. Results also showed that manufacturers have thoughts on switching to an automated system as they increase their capacity.

In terms of infertility, while 71.3% of producers' dairy animals had infertility, animals of 28.7% of producers didn't have any infertility (Table 1). Thoughts were taken from the producers about why their animals were infertile. It has been observed that insemination fails due to the use of concentrated feed in dairy cattle, various diseases, and wrong timing of artificial insemination. The farmers stated that their cows were infertile due to the poor quality of artificial inseminations, the aging of their animals, and the sickness of the animals. Associations and Agricultural Directorates should provide veterinarians experienced in artificial insemination to the producers.

Pasture areas are of great importance for livestock farmers and also for dairy cattle farms, as the farmers reduce feed costs by using pasture. Almost all of the producers in the region (98.0%) stated that pasture areas in the region are insufficient (Table 1), so, feed costs were high. Thus, local authorities should provide more pastureland.

Hiring employees has become more common on dairy farms due to the increase in farm size and the decrease in the size of the family workforce (Malanski et al., 2017). While 55.3% of dairy cattle farms in İzmir province do not employ workers (Table 1), 38.8% employed one person, 3.9% employed two, and 2.0% employed a family.

The results illustrated that farmers started dairy cattle farming for different reasons; such as having a family job (51.0%), providing continuous income (5.5%), and not having another job (11.8%). Besides, 8.8% of farmers work in another job; since dairy cattle are profitable and the region where they live is suitable for dairy cattle, they started dairy cattle to provide additional income (Table 1). Birsin (2012) stated that 75.3% of the farmers began dairy cattle husbandry as the family (father) business. The other reasons stated in his study are that neighbors are dealing with dairy cattle (10.3%), providing continuous income (7.7%), and the only sources of income in the village (6.4%).

While the majority of the producers (49.0%) acquired the technical knowledge from their own experience, 29.4% were obtained from veterinarians, 5.9% from their neighbors, or relatives (Table 2). The primary source for the producers to learn technical information is agricultural consultants. But the results showed that only 2.9% of the farmers obtain technical information from the agricultural consultants. It has been observed that there is a need for agricultural consultants of the producers in the research area, and today, when the technology is developing, the view that the consultants will provide innovative information for farmers is dominant. However, it was stated by the producers that the agricultural consultants are few in number, and therefore the controls in the region are less frequent.

Although agricultural extension activities seem to be better than other regions, it is still insufficient. According to results, 42.2% of farmers participating in the research have never met with agricultural engineers, 39.2% met several times a year, while 53.9% of the owners work with a contracted veterinarian. Contracted veterinarians are usually self-employed and do not visit farms periodically, but only come when the farmers call for them in necessary conditions. Besides, 44.1% of the farm owners benefit from the contracted veterinarians of the cooperatives and associations they are members of. Only 2.0% of the farmers participating in the research have private veterinarians (Table 2). Pirinççi (2015) found that 97.5% of the farmers called the veterinarian when they need, 1.2% of them had contracted veterinarians and 1.2% of them never had any veterinarians for Adana province of Turkey.

The dairy farmers often watch agricultural channels on television and are very satisfied with

Table 2. Structural characteristics of dairy cattle husbandry

	Frequency	%
Reasons to start dairy cattle		
Family occupation	52	51.0
Providing continuous income	26	25.5
Cannot do another profession	12	11.8
Earning additional income	9	8.8
Other	2	2.9
Sources where they provide technical information about dairy cattle		
Own experiences	50	49.0
Veterinarian	30	29.4
Neighbors or relatives	6	5.9
Farm advisors	3	2.9
Factors that prevent farmers from increasing the number of existing animals		
Insufficient land	43	42.10
High feed prices	32	31.60
Insufficient capital	16	15.80
Animal diseases	7	6.60
Priority problems of farmers regarding dairy cattle		
High feed prices	54	52.90
Low milk prices	31	30.40
Failure to provide quality feed	17	16.70
Priority expectations of farmers regarding dairy cattle		
Increasing milk prices, decreasing feed prices	51	50.10
Providing technical information support	36	35.30
Increasing dairy cattle supports	15	14.60
Milking types		
A single system	84	83.2
The pipeline milking parlor	15	14.9
The milking system in the form of a room	2	2.0
Way of giving water to animals		
Free	57	55.9
Buoy	43	42.1
Automatic drinker	2	2.0
Satisfaction situations from artificial insemination		
Not happy at all	2	3.0
Less satisfied	32	31.4
Satisfied	54	52.9
Very satisfied	12	11.8

their broadcasts. These broadcasts help farmers to learn technical information about the care, feeding, and diseases of animals. Agricultural extension and education of farmers in the region were done rarely by directorates of agriculture, union, cooperative, etc. But farmers stated that they need to get information about livestock farming especially husbandry, breeding, and health. Nowadays, with the developing technology, animal husbandry reaches advanced dimensions with each passing day. For this reason, agricultural extension and education studies are very important for farmers both in terms of agriculture and livestock. In animal husbandry; the necessary extension training activities for the farmers, such as artificial insemination methods, feed quality, hygienic and technical properties of shelters, etc., should be carried out by the technical staff of the Ministry of Agriculture and Forestry in certain periods during the year.

Dairy farm watering systems depend on the preference of the producers, but also vary depending on the economic situation of farmers and the number of animals. It has been determined that 55.9% of the producers prefer free watering, 42.2% buoy, and only 2.0% automatic irrigation system to meet the daily water needs of dairy cattle (Table 2).

The presence of female cattle (cow or heifer) is very important for Turkey to progress in animal husbandry and to reach the desired level of animal production. Female cattle is the raw material of cattle breeding, and therefore, with the increase of cows, an increase in both milk production and stock is provided. It was determined that farmers could not increase the number of animals in their area due to insufficient land (42.1%), high feed prices (31.6%), insufficient capital (15.8%), animal diseases (6.6%), and inadequate pasture (3.9%) as shown in Table 2.

The three most significant problems faced by dairy cattle husbandry were found to be high feed prices (52.9%), low milk prices (30.4%), and the inability to provide quality feed (16.7%). The first three expectations that the farmers expect were the increase in milk prices and the decrease in feed prices (50.1%), technical support for dairy cattle producers (35.3%), and the increase in support in dairy cattle (14.6%) (Table 2).

In Turkey, the number of small businesses are still high. Considering small and medium-sized farms, it is quite difficult and expensive to have quality bulls in most of these dairy farms. In some regions, the benefit of many farms from the bull, which is taken jointly, is quite harmful in terms of spreading diseases in cattle. For such reasons, artificial insemination in dairy cattle is very important in terms of correcting genetic features and raising healthy animals. The inseminations must be done correctly and at the optimal times. Within the scope of the research area, 11.8% of the producers are very satisfied with artificial insemination, while more than half (52.9%) stated that they are satisfied, and a small portion (3.9%) stated that the semen did not hold, although they had artificial insemination many times. The success rate of the first artificial insemination to dairy cattle was determined as 36.2% (Table 2).

3.3. Barn types and utilization of animal manure

It has been observed that all the barns in the research area are half-open. When the presence of the barn in the province is examined; the average barn age is 16 years, the average barn area is 947.8 m^2, and the average barn capacity is 64 animals. For a semi-open barn type dairy cattle, an average of 2.5-3.0 m^2 area is required. It has been seen in our research area that each bovine animal has an average area of 16.11 m^2. According to the capacities of the farms examined, barn areas are quite high. Bintaş (2011), for the Trakya region in Turkey, reported that 60.0% of barns are tie-stall barns, 16.0% of them are free-stall barns, and 24.0% of them are of the free type. On the other hand, for Aydın province in Turkey, Nizam and Armağan (2006) reported that 39.0% of the farms used free-stall barns, 17.0% used closed-tied system barn, and 44.0% used the half-open barns. Moreover, in this study, 88.2% of the producers have built barns using credit.

According to survey results, in the researched area, 36.4% of dairy cattle producers clean the barn twice a day, 19.6% once a day, 18.6% once a month, and a very few of them, like 2.9%, twice a year. The average amount of manure obtained from the animals of the farms in the study area was determined as 177.5 tons $year^{-1}$. The majority of farmers keep 76.5% of the solid part of the barn manure and 93.7% of the liquid part in the soil pool or manure tank. While producers do not keep solid manure at all in pools made of concrete, only 1.3% of liquid manure is hold.

As seen in the research area; no producer sells barn manure and throws it into the pasture. All of the producers used barn manure in their land. Producers used 75.0% of the manure in the field and 25.0% in their gardens. Pirinççi (2015) stated that, for Pozantı district of Adana province in Turkey, 71.2% of farmers use fertilizer in their fields and gardens, 15.0% gave it to the requesters, 10.0% did not use it, and 3.8% sold it. Ayman (2014) in his research for Kahramanmaraş province of Turkey; stated that the dairy cattle producers destroyed 48.0% of the fertilizer obtained from their animals, put 45.0% on their land, and 6.20% used a portion of and sell the rest. Boz (2013), in his study in the Eastern Mediterranean Region of Turkey, stated that 62.50% of the farmers used the barn manure in their land, and 20.0% sold it.

3.4. Marketing of milk and dairy products in farms

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, or services to satisfy the needs of individual consumers or organizations (Ringold and Weitz, 2007). Every business wants to successfully market their products and services. In Turkey, 60.0% of the milk marketed, while about 40.0% is supplied to consumers without any processing (Saner, 2012).

All of the services provided until the milk is taken from the producer and reached the end consumer is called the marketing function. Thanks to the marketing services carried out through marketing channels, raw milk that deteriorates quickly reach the consumer in a short time. The first of the marketing channels in the dairy industry is the collection. Since agricultural farms are small and scattered in Turkey, collecting raw milk is a complicated process. For this reason, many dairy farms operate below their capacity. The second channel is processing; starting with the arrival of raw milk collected from the producer, the factory, and dairy, etc.; and the conversion of raw materials (liquid milk) to buttermilk, yogurt, butter, milk powder, pasteurized and sterilized milk. The last channel is distribution. The distribution of milk and its products packaged in the processing channel should be done by paying attention to the fact that they are in the product group that deteriorates quickly. For this reason, the products should also be

distributed with the cold chain system in the distribution channel. Storage conditions should also be kept in cold stores. Thanks to these channels, imbalances in time and seasonal differences between regions are eliminated (Tokmak, 2009).

The producers in the research area were asked how they conserve milk after milking. According to the information received, it was determined that 53.5% of the producers kept milk in a suitable churn/bucket outside the barn, while 46.5% of the producers kept it in cooled tanks outside the barn.

In terms of milk marketing methods of the producers in the study area, while 39.4% of the producers marketed milk to milk collectors, only 9.1% of them were marketed to factories. It was determined that 23.2% of the producers marketed milk to the dairy, while 28.3% of the other producers marketed milk to the cooperative or unions. In the marketing of milk in Kahramanmaraş province of Turkey, it was determined that 81.5% of the producers marketed milk to milk collectors (Ayman, 2014). As a result of the research carried out in the Bursa province of Turkey, 16.7% of the producers in the regional market sold the milk to the milk collectors and more than half (66.7%) sold the milk to factories (İçöz, 2004). In the research carried out in Ödemiş district of İzmir province in Turkey, milk collectors were the most effective means of marketing milk. Besides, it was determined that producers in the region could not provide a union/organization regarding the marketing of milk (Koyubenbe, 2005).

Milk sold in Turkey in recent years is cold milk and the prices of milk purchased increase by looking at quality standards. It was seen during these studies that these conditions cause a difference in milk prices in İzmir province. Moreover, there was a difference between the price of milk sold in cold tanks and the price of milk sold in regular jugs. A cold milk tank is very important in terms of nutritional values in milk, protection of beneficial bacteria, and long-term freshness of milk. Milk stored in a cold milk tank is sold at a higher price, and farmers with a cold milk tank receive support at a higher price while receiving Government support for milk. For this reason, cooperative, union, or the Agricultural Directorates should provide a common cooling tank to the farmers, especially those with few animals, which do not have a cold milk tank.

In terms of processed dairy products, after converting milk into dairy products such as cheese, buttermilk, and yogurt, 31.2% of the producers sell dairy products to the dairy firm, 18.8% to the factory, 12.5% to the wholesaler, and 10.4% to the retailer. Besides, 27.1% of the producers marketed milk by themself or to cooperatives or unions.

3.5. Problems of dairy cattle farmers and proposed solutions

Various opinions of dairy cattle farmers participating in the survey are summarized in Table 3. Results interpreted in a five-point Likert scale from 1= Strongly disagree, 2= Disagree, 3= Somewhat agree, 4= Agree, 5= Strongly agree. Means of scale were evaluated as strongly disagree (0.00-1.46), disagree (1.50-2.49), somewhat agree (2.50-3.49), agree (3.50-4.49), and strongly agree (4.50-5.00) (Palaz and Boz, 2008). The problems faced by farmers are listed according to their importance level.

The biggest problems of dairy cattle producers in the region are the high prices of roughage and concentrated feed (4.60). Although Turkey has

Table 3. The ideas of farmers on the problems of dairy cattle

Opinions	Mean	Standard deviation	Categories
High-level prices for roughage and concentrated feeds	4.60	0.699	Absolutely agree
Animal imports negatively affect production and prices	4.26	1.001	Agree
Lack of pasture land	4.17	1.164	Agree
Policies for milk production are inadequate	4.14	0.985	Agree
Failure to compete with corporate businesses	3.93	1.177	Agree
Insufficient capital	3.89	1.207	Agree
Lack of qualified labor	3.50	1.307	Agree
Rains are excessive during the period of making grass and hay	3.50	1.320	Agree
Lack of shepherds in the region	3.40	1.465	Somewhat agree
insufficient technical knowledge	3.32	1.224	Somewhat agree
Lack of quality bulls	2.85	1.381	Somewhat agree
Lack of quality roughage	2.79	1.394	Somewhat agree
Inability to provide hygienic conditions in milk production	2.71	1.358	Somewhat agree
The barn is not suitable for animal husbandry	2.61	1.385	Somewhat agree
Insufficient veterinary services	2.49	1.433	Not agree
Animals get sick often	2.21	1.258	Not agree

progressed in the field of cattle breeding compared to previous years, sometimes the number of animals is not enough, and animals are imported from abroad. In this regard, it has been determined that the producers of the region agree with the judgment of "imported animal production affects production and prices negatively" (4.26). Another issue that producers join is "policies regarding milk production are insufficient" (4.14). The other issues that the farmers found important and join are "the lack of qualified labor" (3.50) and "insufficient capital to increase dairy cattle" (3.89) (Table 3).

4. Conclusions

The objective of this study was to analyze the structure of dairy cattle holdings in İzmir province by using cross-sectional survey data. It has been observed that farmers with few animals do not obtain sufficient income. Smallholder dairy farms should be offered various policies to increase their livestock numbers. Directorates of Provincial Agriculture and Forestry and cooperatives should gather farmers with few animals in villages and neighborhoods, create a common barn, provide a common cold milk tank, technical support, and low-cost feed and medicines, and support producers to give their milk at a fixed price. In this way, Smallholder dairy farms can also expand, and dairy farms can continue their livestock activities not only for livelihood but also for commercial purposes.

The most uncomfortable issue for farmers in dairy cattle husbandry is the high cost of feed and diesel oil, and also the constantly changing prices in feed and milk. The Ministry of Agriculture and Forestry should determine the necessary policies in this regard, and ensure stability in feed and milk prices. In addition, directorates, unions, and cooperatives should be united in this regard and provide the necessary technical information to farmers in certain periods of the year. Farmers want to sell milk without any mediator. When collectors buy milk and sell it or market it to dairy, cooperatives, and unions, milk reaches consumers with high prices, but the farmers receive a small share of this high price. By bringing together small farms, a barn and a cold milk tank should be provided to the farmers. In this way, problems such as technical support, feeding ration system, low-cost veterinary service, and high price value in the marketing of milk can be prevented.

The state needs to make permanent policies to increase the marketing of milk in domestic and international trade. In this way, the livestock sector can become an international strategic sector in Turkey. In the sector, producers who aim to grow and want to make this sector a profession should be supported. The instability in concentrate feed prices should be eliminated, and high feed prices should be interfered with. The moreover, the amount of quality roughage should be increased so that the cost of the producer should be reduced and the continuity of production should be ensured.

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References

Akbay, C., Bilgiç, A., Şahin, A., Tümer, E.İ., 2015. Effects of Supports on Dairy Farm Profitability in Turkey. Tübitak Project No: 1120824, p. 113. (In Turkish).

Akbay, C., Boz, İ., 2005. Turkey's livestock sector: Production, consumption and policies. *Livestock Research for Rural Development*, 17(9): 1-11.

Ağır, HB., Akbay, C., 2018. Factors affecting on the producers' utilization of beef cattle support. *Kahramanmaraş Sütçü İmam University Journal of Agriculture and Nature*, 21(5): 738-744. (In Turkish).

Anonymous, 2014. Meat and Milk Institution Sector Report. (http://tarim.kalkinma.gov.tr/wpcontent/uploads/2015/12/2014_Yili_Sektorel_Degerlendirme_Raporu.pdf), (Accessed: 01.06.2016). (In Turkish).

Anonymous, 2019. Dairy Sector Statistics in the World and Turkey, National Milk Council 2019 Report, Ankara, Turkey (https://ulusalsutkonseyi.org.tr/wp-content/uploads/Ulusal-Sut-Konseyi-Sut-Raporu-2019.pdf), (Accessed: 23.10.2020). (In Turkish).

Anonymous, 2020a. Livestock Statistics. Turkish Statistical Institution, Ankara, Turkey. (https://www.tuik.gov.tr/en/), (Accessed: 23.10. 2020). (In Turkish).

Anonymous, 2020b. FAOSTAT Data. Food and Agricultural Organization of the United Nations, Roma, (http://www.fao.org/faostat/en/), (Accessed: 23.10.2020).

Aras, İ., 2015. Dairy Industry Report. Research Study Planning Unit, Mevlâna Development Agency, Konya, Turkey. (In Turkish).

Ayman, H., 2014. Structure characteristics, problems and solutions of dairy farms in the central district of Kahramanmaras. Master thesis, Kahramanmaraş Sütçü İmam University Institute of Science, Kahramanmaraş, Turkey. (In Turkish).

Baştan, A., 2017. The Effect of Mastitis on Milk Yield, Structure and Quality. (https://hayvancilikakademisi.com/yazar/profdr-ayhan-bastan/mastitisin-sut-verimi-yapisi-ve-kalitesi-uzerine-etkisi/), (Accessed: 19.10. 2020). (In Turkish).

Bintaş, H., 2011. A survey of dairy cattle business' economical and structural problems in the Trakya

region. Master thesis, Namık Kemal University Institute of Science, Tekirdağ, Turkey. (In Turkish).

Birsin, S., 2012. Current state, problems and solution proposals of dairy farms in Balya district of Balıkesir province. Master thesis, Gaziosmanpaşa University Institute of Science, Tokat, Turkey. (In Turkish).

Boz, İ., 2013. Structure and problems of dairy farms in the Eastern Mediterranean Region (Turkey). *Kahramanmaraş Sütçü İmam University Journal of Agriculture and Nature*, 16(1): 24-32. (In Turkish).

Boz, I., Akbay, C., Bas, S., Budak, D.B., 2011. Adoption of innovations and best management practices among dairy farmers in the Eastern Mediterranean Region of Turkey. *Journal of Animal and Veterinary Advances*, 10(2): 251-261.

Eryılmaz, G.A., Kılıç, O., Boz, İ., Kaynakçı, C., 2020. Evaluating the adoption of agricultural innovations and information sources of dairy cattle farms: The case of Bafra and Canik districts of Samsun province, Turkey. *Journal of the Institute of Science and Technology*, 10(2): 1361-1369. (In Turkish).

İçöz, Y., 2004. The Analysis of Profitability and Productivity of Dairy Cattle Enterprises in Bursa Province. Tepge, Publication Number: 116, Ankara, Turkey. (In Turkish).

Kılıç, O., Eryılmaz, G.A., 2020. Structural characteristics of dairy cattle farms in Samsun Province. *Turkish Journal of Agricultural and Natural Sciences*, 7(3): 637-645. (In Turkish).

Koyubenbe, N., 2005. A research on the possibilities of improving the dairy farms in Odemis province of Izmir. *Ege University Journal of Animal Production*, 46(1): 8-13. (In Turkish).

Malanski, PD., Hostiou, N., Ingrand, S., 2017. Evolution pathways of employees' work on dairy farms according to task content, specialization, and autonomy. *Cahiers Agricultures*, 26(6): 1-8.

Muradi, A.J., Akbay, C., 2018. Structure and marketing opportunities on dairy farms in Konya province, Turkey. *International Journal of Scientific Research and Management*, 6(1): 756-762.

Nizam, S., Armağan G., 2006. Determination of productivity of market oriented dairy farms in Aydın province. *Adnan Menderes University Journal of Agricultural Faculty*, 3(2): 53-60. (In Turkish).

Oğuz, C., Yener, A., 2016. Structure and problems of dairy farms in the case of Konya province. *Journal of Selçuk University Natural and Applied Science*, 5(3): 1-14.

Önal, A.R., Özder, M., 2008. Structural characteristic of the dairy farms that members of Cattle Breeders Associations in Edirne. *Journal of Tekirdağ Agricultural Faculty*, 5(2): 197-203. (In Turkish).

Palaz, S., Boz, İ., 2008. Factors influencing college graduate adults to provide volunteer service in different organizations. *Balıkesir University Journal of Social Sciences Institute*, 11(19): 95-106. (In Turkish).

Pirinççi, E., 2015. The general structure, problems and some suggestions of dairy cattle farms at Pozanti district of Adana. Master thesis, Çukurova University Institute of Science, Adana Turkey. (In Turkish).

Ringold, D.J., Weitz, B., 2007. The American marketing association definition of marketing: Moving from lagging to leading indicator. *Journal of Public Policy and Marketing*, 26(2): 251-60.

Sailo, B., Chakraborty, S., 2012. A brief overview of mastitis and other infectious diseases of cattle in India having public health concern. In: U. Singh, R. Deb, S. Kumar and A. Sharma (Eds.), Livestock Update, pp. 91-122.

Saner, G., 2012. Basic Marketing Strategies in the Dairy Industry. Ege University, Department of Agricultural Economics, (http://www.tkmyo.ege.edu.tr/dosyalar/sutsempozyumu/Sut Sempozyumu/ PazarlamaStrateji.pdf), (Accessed: 22.10.2020), (In Turkish).

Seki, İ., Biler, T., 2016. SWOT analysis for cattle breeding firms: The case of Biga. *Çanakkale Onsekiz Mart University Journal of Agriculture Faculty*, 4(1): 51-59. (In Turkish).

Soyak, A., Soysal, M.İ., Gürcan, E.K., 2007. In investigation of structural properties of dairy enterprises and morphologic characteristics of black and white cattle in Tekirdağ province. *Journal of Tekirdağ Agricultural Faculty*, 4(3): 297-305. (In Turkish).

Tokmak, T., 2009. Economic analysis of dairy farms and market supply of milk in Niğde province. Master thesis, Niğde University Institute of Social Science, Niğde, Turkey, (In Turkish).

Topçu, Y., 2008. Analysis of Success factors in dairy farms: case study of Erzurum province. *Ondokuz Mayıs University Journal of Faculty of Agriculture*, 23(1): 17-24. (In Turkish).

Uygur, A.M., 2015. A research on the current situation and development of dairy cattle in İzmir province. Ph.D. thesis, Ege University Institute of Science and Technology, İzmir, Turkey, (In Turkish).

Varışlı, Ö, Akyol, N., 2018. Factors affecting reproductive performance of dairy cattle. *Journal of Lalahan Livestock Research Institute*, 8(3): 1-6. (In Turkish).