



Determining Some Structural Characteristics and Mechanization Potential of Dairy Cattle Farms in Karacabey District of Bursa Province

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ABSTRACT

In this study, is aimed to determine some structural characteristics and mechanization potential of dairy cattle farms in Karacabey District of Bursa province and data were obtained with 59 questionnaires, which were made by one-on-one interviews with cattle farms, selected by random sampling method. The enterprises owners, visited in Karacabey District, educational levels as follows; 74.5% primary school, 15.6% secondary schools, 3.3% high school, 3.3% universities and 3.3% postgraduate level. While 86.4% of the owners are involved in agricultural activities in addition to dairy cattle, 13.6% are only involved in dairy cattle. Of 51 enterprises, engaged in agricultural production, 74.5% grow silage corn, 56.8% barley, 11.8% vetch and 19.6% alfalfa. Holstein Hybrid is grown intentionally in the region with 86.4%, while Simmental is preferred with 11.9% and Montofon with 1.7%. It was determined that 52.5% of the enterprises consisted of closed and 47.5% of semi-open barns, 98% of which were concrete and 1.7% were soil. 42.4% of barns have a ventilation pipe, while 57.6% do not. 84.7% of the enterprises have separate sections for calves and 52.5% have separate sections for cows, will give birth. Average daily milk yield quantity is detected as 18.6 kg in the region. 62.7% of the enterprises use mobile machines, while 37.3% of the them use milking system to milking process.

1. Introduction

The Agricultural sector has increased its importance in improvement and industrialization process of developed and developing countries day by day. Even for developed countries, that are more focused on the industry and services., agriculture is still very important in economic and social terms (Demir and Sancar., 2012). The agricultural sector plays a very important role in the economy of the country, it does not only supply the population with food but also contributes with raw material for industrial sector, creates demand for industrial product, helps the national income as well as foreign currency for the country in terms of exportation (Tunç., 2018).

Agricultural Production is the activity of producing, storing and processing animal goods and vegetables under proper circumstances as well as the marketing

and permanent improvement of those mentioned before. (Doğan et al. 2015; Güzel 2016).

Husbandry sector supports important economical activities like supplying raw materials for several production lines, added value, increasing the income of the logistic sector and retailing, helping rural development, besides its contributions to the nutrition of the nationals. (Anonymous 2019).

About 90% of the production in the dairy sector, which is one of the most important components of the food sector, is obtained from milk cows, in Turkey, as is the case with worldwide. (Akman et al., 2010, Güzel 2016).

Dairy cattle production is an important branch of the livestock sector in our country and contributes to development of the country in various ways. Considering the producers, a big part of the population, which living in rural areas, in Turkey is to live off dairy cattle. Dairy cattle farming is managed as both in large-scale commercial enterprises and in several dairy cows as family businesses, especially in areas close to the provinces, that with large populations. Livestock activities require intensive labor force because of that, the large

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* This study is summarized from Hilmi TUTAR's Master's thesis.

scale enterprises make significant contributions to employment in their provinces. Family businesses, which are more than other enterprises in number, contribute to the on site development of agrarian populations in every region. (Boz, 2013).

A healthy database is needed for forward-looking rational policies in the livestock sector. (Cenan, Gürcan 2011). In Turkey, there are many studies, aimed at determining the structural status of cattle raising enterprises in different provinces. Repetition of these type of studies more commonly and at regular, is important in order to update the data in the sector, determine the current situation, keep track of changes over the years and determine the problems of the sector and produce solutions for these problems and finally to make rational planning for the future (Şeker et al., 2012; Güzel, 2016).

Some of the problems of the sector affect the entire sector on the country basis and others may differ from region to area or province. Therefore, working on the local level and searching the issue in depth are important, in order to develop consistent solution proposals. (Boz, 2013).

In this study, it is aimed to that, determine and evaluate the some structural and mechanization potential characteristics of dairy cattle farms in Karacabey District of Bursa province and to shed light on the regional policies to be implemented.

2. Material And Method

2.1. Material

The main material of this study, which examined some structural characteristics and mechanization potential of dairy cattle breeding enterprises in Karacabey district of Bursa province, where dairy cattle farms are concentrated, is the data obtained from one-to-one questionnaires conducted with owners or authorized persons in January-March 2019 period.

2.2. Method

2.2.1. Detecting the enterprises will be searched on and preparing survey form

Stratified random sampling method was used in the selection of the enterprises to be surveyed and the sample volume was calculated according to the following formula (Yamane, 2001).

$$n = \frac{N \cdot \sum_h S_h^2}{N^2 D^2 + N \sum_h S_h^2}$$

In formula;

n: Sample volume,

N: Enterprise quantity in population

Nh: Enterprise quantity in "h" stratify

Sh₂: Variance of "h" stratify

D₂: Permissible fault amount from population average (D₂ = (e/t)²),

e: Permissible fault lot from population average,

t: The value is, on distribution table, detected according to fault rate.

The number of sample farms, to be surveyed, was determined, by stratified random sampling method and considering the number of dairy cows in the farms, as 59 pcs with 1% error margin and 99% confidence limit.

The enterprises that make up the population are divided into 4 layers (1-3, 4-11, 12-35, 36+ of the 4 size group) by taking into consideration the distribution of cows. The enterprises in the sample were distributed to the layers by using modulating distribution method $n_h = (N_h / N) \cdot n$. By this way, the surveys were conducted with the enterprises from the first layer 4pcs., the second layer 17 pcs., the third layer 18 pcs., the fourth layer 20 pcs., so the enterprises to be sampled, determined randomly from each layer. Besides, substitute enterprises were determined, as 10% of the sample volume, in cases that the responsables of sample enterprises, can't be found at places (Güzel and Aybek 2017).

You can see at following table, the number of enterprises and the number of milking animals, for each group, in the enterprises, that divided into four layers

Table 1

Enterprise and Animal Quantity in Groups

Enterprises Groups	Animal Qty.	Enterprises Qty
1. Group	1-3	4
2. Group	4-11	17
3. Group	12-35	18
4. Group	36+	20
Total		59

In 59 questionnaires, conducted in Karacabey district, comprises the information about the characteristics of proprietor and employees (experience, education, training, etc.), general and structural characteristics of enterprises (land size, area of activity, animal species and numbers, animal milk yields, Shelter type and characteristics, time consumption of daily work on animals, forage crops grown and fed in the Enterprise, etc.), mechanization characteristics of the enterprises (machine type, number and characteristics, etc.), provision of machinery conditions and their expectations. The questionnaire consists of closed and open-ended questions.

3. Results and Discussion

The work experiences of the operators, in 59 dairy cattle enterprises, that are the subject of our research are divided according to the groups determined by the number of animals, in Table 2. Among the farms with 1-3 animal, the average period of husbandry is 42.5 years according to groups of operators experience as to this study. This value has been determined respectively as 26.5, 27.7 and 25.5 years for enterprises with 4-11,

12-35 and lastly 36 + animals. In general, average of the experience of 59 business owners was calculated as 27.5 years (Table 2). Özyürek et al., (2014), The study, conducted in the District of Erzincan province, reported that the average time of the experience of operators in cattle farming is 22 years.

Table 2

Experience of Enterprise Owners

Experience of Enterprise Owners	Enterprise Groups			
	1-3 animal	4-11 animal	12-35 animal	36+ animal
<i>Cattle Breeding Duration (Average year)</i>	42.5	26.5	27.7	25.5

The education level of producers in Karacabey district is given in Table 3. When the educational level of business owners is examined in, it is observed that there are no uneducated business owners. When the education level of the operators is examined, emergent

Table 3

Education Level of Enterprises Owner

Groups	Education Level Of Operator					Total
	Primary school	Secondary	High School	University	Postgradu-	
1-3 animal	3 (75%)	1 (25%)	-	-	-	4
4-11 animal	17 (100%)	-	-	-	-	17
12-35 animal	11 (61.1%)	5 (27.7%)	2 (11.2%)	-	-	18
36+ animal	13 (65%)	3 (15%)	-	2 (10%)	2 (10%)	20
General	44 (74.5%)	9 (15.6%)	2 (3.3%)	2 (3.3%)	2 (3.3%)	59

$\chi^2=19.206$; SD=12; p=0.084

Table 4 shows the land sizes of the enterprise groups. Considering the land sizes; among the groups with 1-3,4-11,12-35,36 + animals, total dry land sizes are 78, 291, 455, 799 respectively. And total sizes of irrigated land are 74, 464, 1701, 4223 respectively. (Güzel, and Aybek, 2017) In the study, done in Kahra-

Table 4

Land Sizes at Enterprises

Sizes of Land Belong to Enter-	Enterprise Groups				Total
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
Dry Land (da)	78 (51.3%)	291 (38%)	455 (21.1%)	799 (15.9%)	1623 (20%)
Irrigated Land (da)	74 (49.7%)	464 (62%)	1701 (78.9%)	4223 (84.1%)	6462 (80%)
Total (da)	152 (100%)	755 (100%)	2156 (100%)	5022 (100%)	8085 (100%)

$\chi^2=131.840$; SD=102; p=0.025

86.4% of dairy cattle farms are active in agriculture additively, while 13.6% are only engaged in dairy cattle. (Table 5). As to the results of (Özyürek et al., 2014), found in Çayırılı District of Erzincan province;

results are follows; in 1-3 groups; 3 of them primary schools graduate (75%), 1 of them secondary school graduate (25%), in 4-11 group; 17 of them primary schools graduate (100%), in 12-35 group; 11 of them primary school graduate (61.1%), 5 of them secondary school graduate (27.7%), 2 of them high school graduate(11.2%), among 36+ groups; 13 of them primary school graduate(65%), 3 of them secondary school graduate (15%), 2 of them university graduate (10%) and 2 of them postgraduate (10%) . As to the general average, 74.5% of enterprise owners elementary school graduate, 15.6% of them secondary school graduate, 3.3% of them high school graduate, 3.3% of them university graduate, and 3.3% of them postgraduate. (Table 3). (Gençoğlan, 2017), According to the study, conducted in Kahramanmaraş province, enterprise owners educational levels are follows; 46.4% of them primary school graduate, 21.5% of them high school graduate and 32.1% of them university graduate. (Avsever, 2016), Moreover the study, conducted in Ereğli District of Konya province, determined that; 74.83% of enterprise owners graduated from primary and secondary school.

manmaras province; determined average land sizes are, irrigated ones 8.2 hectares, dry ones 7.3 hectares and this research detected that, minimum irrigated land size is 1 hectare, maximum 100 hectares, and minimum dry land size is 1 hectare, maximum 30 hectares.

26.3% of the operators are only active in dairy cattle farming, while 62.6% of the rest also engaged in other branches of agriculture.

Table 5
Enterprises that are engaged in Other Activities

Other activity area of enterprise	Enterprise Groups				
	1-3 animal	4-11 animal	12-35 animal	36+ animal	Total
Available	4 (100%)	15 (88.2%)	17 (94.4%)	15 (75%)	51 (86.4%)
Not	0	2 (11.8%)	1 (5.6%)	5 (25%)	8 (13.6%)

The distribution of 51 enterprises, that are interested in other branches of agriculture, with dairy cattle breeding, and their products are given in Table 6. As it can be seen from the table, corn (74.5%) is produced by 38 enterprises. The group, which has the most corn production (88.8%), is the 12-35 group, with 16 quantity. Barley is produced by 29 of the enterprises (56.8%). The highest barley production (66.6%) is realized in 12

enterprises, which are at 12-35 group. 11.8% of enterprises in total, produce vetch. In each 1-3,4-11,36 +groups, 2 producer grows vetch. Vetch is not produced in 12-35 group. There are no rye producers among the enterprises. Clover production is realized by 10 of the enterprises (19.6%). The highest clover production (23.5%) was detected at 4-11 group (Table 6)

Table 6
Products, are grown at Enterprises

Agricultural Products	Enterprise Groups				Total
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
Maize	4 (100%)	8 (47%)	16 (88.8%)	10 (50%)	38 (74.5%)
Barley	4 (100%)	6 (35.2%)	12 (66.6%)	7 (35%)	29 (56.8%)
Vetch	2 (50%)	2 (11.7%)	-	2 (10%)	6 (11.8%)
Clover	3 (75%)	4 (23.5%)	1 (5.5%)	2 (10%)	10 (19.6%)

The data of the dairy cows, which are the basis for the formation of the research groups and farm numbers, are evaluated as follows. The total quantity of dairy cows, in 1-3 group, is 8. In this group, dairy cow quantities are as follows; Holstein and Holstein hybrid is (50%) 4 and (50%) Simmental and Simmental Hybrid is also 4. In 4-11 group, dairy cow quantities are; Holstein and Holstein hybrid is 111 (85.38%), Simmental and Simmental hybrid is 10 (7.69%), Montofon is 9 (6.93%). The breed distribution of 12-35 Group, which has 396 cows in total, is, Holstein and Holstein hybrid is 361 (91.16%) Simmental and Simmental hybrids is 35 (8.84%). Lastly, in 36+ group, the total quantity is detected as 1111, and distribution of them is; 891 (80.20%) Holstein and Holstein hybrid, (19.80%) 220 Simmental and Simmental hybrid

Among the four different enterprise groups, the Holstein and its hybrid are the most common breed and covering 86.4% of the total number. The Simmental and its hybrid are the most common breed after the Holstein and its hybrid, with 11.9% rate. Among enterprises, the least common dairy cow breed is the Montofon, with 1.7% rate. The study conducted by (Öztürk, 2009) in Mardin province, reported that among the current breeds Holstein (44.3%) was the most common breed and second one is Simmental (20.13%), on the other side the ranges of domestic breed and the brunet breed are (38.58%), (4.97%) respectively. This situation is in parallel with the results obtained. On the other hand (Özyürek et al., 2014) presented that, in the Erzincan region with 45.4% rate Brown and with 47.8% rate Yellow breed are dominant culture breed, while Black Holstein breed preferred less.

Table7
Animal Specifications

Animal Specifications	Enterprise Groups				
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
Quantity	8	130	396	1111	
Cow	Holstein and Hybrid	75%	85.3%	91.1%	80.2%
	Simmental and Hybrid	25%	7.8%	8.9%	19.8%
	Montofon	-	6.9%	-	-

The barn types, used in the 59 enterprises, were found to that, among 1-3 group all of them are closed (100%), in 4-11 group (5.9%) one of them is half-open, (94.1%) 16pcs are closed, in 12-35 group, (44.4%) 8 pcs are half-open, (55.6%) 10 pcs are closed, and in 36+ group (95%) 19 barns are half-open, and 1(5%) of

them is closed (Table 8). When the farm groups are examined, an increasing in semi-open system among the group, which the animal quantity is at rise and using semi-open system in 36+ groups commonly indicate that modern barn types become common as the farms grow.

According to this; the study conducted in Kars by (Tilki et al., 2013), 79.1% of enterprises, the study conducted, in Kayseri by (Uğurlu, and Şahin, 2010), 75.0% of enterprises, the study is conducted in Ağrı, by (Bakan, 2014) 97.2% of them are from closed; in case the study conducted by (Yener et al., 2013) shows that, in South East Anatolia Region, 17.5% of barns are closed and 8.5% of barns are semi-open.

Table 8
Barn Types

Barn Types	Enterprise Groups			
	1-3 animal	4-11 animal	12-35 animal	36+ animal
Closed System	100%	94.1%	55.6%	5%
Semi-open Systems	-	5.9%	44.4%	95%

$\chi^2=33.592$; SD=3; p=0.000

The floor material used in the barns are detected that; is in 1-3 group; (75%) 3 barns are concrete, (25%) 1 barn is soil, in 4-11 group; 17 barns (100%) are concrete, in 12-35 group, 18 barns (100%) are concrete and in 36+ groups 20 barns are (100%) concrete.

As the size of the barns increasing, the use of concrete as a base material becomes inevitable This can be interpreted as a necessity considering requirements such as cleaning, animal control and animal traffic. Table 9 shows the base material information of the enterprise groups.

(Mundan et al., 2018), in their study conducted in Şanlıurfa province, it was reported that 85.2% of operators preferred concrete structure and 14.8% preferred compressed soil as shelter ground in dairy cattle enterprises. On the other hand, (Şeker et al., 2012) determined that breeders generally used concrete (59%), then Stone (20.5%), soil (16.4%) and wood (4.1%) for base of the barn.

Table 9
Barn Floor Material

Barn Floor Material	Enterprise Groups			
	1-3 animal	4-11 animal	12-35 animal	36+ animal
Concrete	75%	100%	100%	100%
Soil	25%	-	-	-

$\chi^2 = 33.592$; SD=3; p=0.576

Barn size averages, which differ by business groups, have been discussed. In the light of the data, among the enterprise groups, the highest average barn size is 936 m² in 36+ group. When looking at the groups; 12- 35 group values, the average barn size is 356 m², in 4-11 group the it is 104 m², and among 1-3 group it is 42 m². (Table 9).

In Table 10, the status of the barns ventilation chimneys, which were important in the enterprises,

were given. The situations of chimney, according to groups as follow; in 1-3 group, 2 (50%) enterprises have, two of them (50%) do not, in 4-11 group, 8 enterprises have (47.1%) ,9 of the (52.9%) do not, in 12-35 group; 10 enterprises (55.6%) have and 8 of them (44.4%) do not and in 36+ group 5 (25%) enterprises have and 15 of them (75%) do not. In addition, when we looked at enterprises in general, 42.4% of the enterprises have ventilation chimneys and 57.6% of them do not.

(Özyürek et al. 2014), the study examined in the region, 86.3% of the barns have ventilation chimneys, 13.7% of them do not have. Also in the study conducted by (Öztürk, 2009) in Mardin province 5.17% of of existing barns have ventilation chimneys, while 44.83% of them do not.

Table 10
Barn Size and Ventilation

Changeable Factors	Enterprise Groups				
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
Barn Size (m ²)	42	104	356	936	
Barn Ventilation Pipe	Available	50%	47.1%	55.6%	25%
	Not	50%	52.9%	44.4%	75%

$\chi^2=138.738$; SD=135; p=0.395

Calf partitions form in enterprises, are seen as; in 1-3 group 2 (50%) of them has separate partition at same barn, 1 of them (25%) has no separate partition and 1 of them (25%) separate partition at different barns. 4-11 group has the most diversity in this subject. Accordingly, calves are raised, in separate partitions in the same barn at 8 enterprises (47.1%), at 6 enterprises (35.3%), at same barn with mother, at 1 enterprise (5.9%) at individual calf cage and at 2 enterprises (11.8%) in separate partition at different barns. In 12-35 group, calves are grown in separate partition in the same barn in 7 of the businesses (38.9%), in 5 of them (27.8%) individual calf cage is used and in 6 enterprises (33.3%) use separate partition at different barns. In 36 +group, calves are grown in separate partition in the same barn in 5 of the enterprises (25%), in individual calf cages in 10 enterprises (55%), and in separate partitions in different barns in 3 enterprises (20%). The rate of usage separate partitions for calves, among businesses, is 84.7% (Table 11).

Özyürek et al., (2014) in their study, 59% of businesses found calves to be free in a separate partitions, while 41% said they grown them in a separate partitions, (Öztürk, 2009) and in the study, 93.9% of the businesses observed that calf partitions were located in the barn.

Table 11
Calf Partition Forms

Calf Partition Forms	Enterprise Groups			
	1-3 animal	4-11 animal	12-35 animal	36+ animal
Separate Partition at the same barn	50%	47.1%	38.9%	25%
At the same barn with mother	25%	35.3%	-	-
Individual Calf Cage	-	5.9%	27.8%	55%
Separate Partitions at different	25%	11.7%	33.3%	20%

$\chi^2=25.318$; $SD=9$; $p=0.003$

In 4 enterprises of 1-3 group (100%), cows that give birth have no separate places. Among 4-11 group; 5 enterprises (29.4%) have separate places for cows to give birth, in 12 businesses, it is not available. In 12-35 group, 10 enterprises (55.6%) have separate places for the cow for birth, 8 enterprises (44.4%) do not. The group with the highest number of separate places for cows to give birth, is the 36+ Group. Accordingly, 16 enterprises (80%) have separate places while 4 enterprises (20%) do not (Table 12). In general, it is determined that, 52.5% of enterprises have separate places for cows to give birth. Here under, as the size of enterprises increases, it is observed that there are more individual places needed for animals. In similar studies have been conducted by; (Öztürk, 2009) and (Özyürek et al., 2014) it is detected that, respectively 45.5% and 6.6% of enterprises have separate places for cows to give birth. When studies examined it is seen that, similar results were found with (Öztürk, 2009), while results is seen to be different with (Özyürek et al., 2014).

Table 12
Separate Place for Birth

Separate Place for Birth	Enterprise Groups			
	1-3 animal	4-11 animal	12-35 animal	36+ animal
Available	-	29.4%	55.6%	80%
Not	100%	70.6%	44.4%	20%

$\chi^2=14.189$; $SD=3$; $p=0.003$

In Table 13, the average milk yields of 59 business groups that are the subject of research, are observed. As can be seen from the examination of the table, average milk yields were determined as 16.2 kg in 1-3 group, 17.3 kg in 4-11 group, 18.8 kg in 12-35 group and 20.1 kg in 36+ group. In general, the results were found to be 18.1 kg day-1.

Şeker et al., (2012), reported that, the proportion of whom reported getting an average of 15 kg and more milk per day in the study was 3.2% and 78.4% of business reported having an average daily milk yield of 7 kg and less.

Elmaz et al., (2010), in the study of, Burdur province dairy cattle production and its characteristics, they reported that the average of the milk yield is 18.7

Table 13
Milk Yield

Milk Yield	Enterprises Groups			
	1-3	4-11	12-35	36+
Average Milk Yield (kg day-1)	16.2	17.3	18.8	20.1

Milking in enterprises in the region, 1-3 group (100%) with milking machine in the 3 businesses, 4-11 group (88.2%) with Mobile machine in 15 businesses, (11.8%) 2 milking systems in 12-35 group (77.8%), 14 Mobile machine (22.2%), 4 milking systems and finally; in 36+ group (20%) 4 enterprises mobile machine (80%), 16 operation milking systems was found be carried out. Looking at the overall to 59 businesses (62.7%), the part of 37, the milking process with Mobile machine (37.3%), and the part of 22 was found to be carried out by milking systems. (Table 14). In addition, it was found out that; the enterprises, which have big quantity animals, (36+ heads) (80%) preferred milking systems.

Akar, (2015) stated in the study conducted in Muş plain that; 75% of the 73 farms have milking machines and 10 of these milking machines; are pipeline milking systems and 47 of them are mobile machines. (Öztürk, 2009), In the study carried out in Mardin province, 95.24% of the operators milked by hand and 4.76% by machine. (Demir, Sancar, 2012), Gümüşhane province Kelkit, Köse and Şiran districts of 37.3% of businesses by hand, 62.7% of mobile machine milking highlights. (Akbaş, et al., 2015), The results he encountered in his work in 39 provinces were that 93% of the visited businesses milked in the milking room while 7% milked in the barn.

When the types of milking systems used in the enterprises that are the subject research are evaluated; in 4-11 group enterprises 2 pipeline milking system (11.8%), in 12-35 group 1 herringbone milking system (5.6%), 3 pipeline milking system (16.6%) and in 36+ group; 7 herringbone milking system (35%), 9 pipeline milking system (45%) is used (Table 15).

Gençoğlan, (2017), in the study carried out in Kahramanmaraş province, 65.5% of the enterprises have a milking parlor, while 17.2% of the enterprises have a parallel milking system, 48.3% used a herringbone milking system.

Table 14
Enterprises Milking Types

Milking Type	Enterprise Groups				Total
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
By Mobile Machine	4 (100%)	15 (88.2%)	14 (77.8%)	4 (20%)	37 (62.7%)
By Milking System	-	2 (11.8%)	4 (22.2%)	16 (80%)	22 (37.3%)

$\chi^2=24.464$; $SD=3$; $p=0.000$

Table 15
Milking Systems Types at Enterprises

Milking System Types	Enterprise Groups				Total
	1-3 animal	4-11 animal	12-35 animal	36+ animal	
Herringbone Milking System	-	-	1 (5.60%)	7 (35%)	8 (36.3%)
Pipeline Milking System	-	2 (11.8%)	3 (16.6%)	9 (45%)	14 (63.7%)
General	-	2 (9.3%)	4 (18.3%)	16 (72.3%)	22 (100%)

4. Conclusion and Recommendations

It has been found that the work experience of the breeders in the enterprises decreases as the number of animals increases and this shows that the new generations started animal husbandry in high numbers. In parallel with this, it is determined that the education level is high in the enterprises with high number of animals. Regular training can be provided for small enterprises (1-3 heads, 4-11 heads) in order to benefit from this.

The big part of dairy cattle enterprises are involved in other agricultural activities with dairy cattle. Enterprises in different area of business will be beneficial to the business economy and will respond to various needs. To increase such activities and to encourage business owners, various facilities such as low-interest credit can be provided.

Among the enterprises engaged in agricultural activities, mainly forage corn is grown although barley, alfalfa, vetch.

According to the research data, the average land size of enterprises, with large numbers of animals, was seen to be greater than. This can be related to the economy and the need for forage crops in the farm compared to the number of animals.

According to the results of the study in Karacabey region, the dominant race, density was determined as Holstein, Simmental and Montofon respectively.

The barn types in the area are two varieties, closed and semi-open. Among these, it is seen that closed barns stand out and open barns are in enterprises with more animals. Barn type selection is very important for both

animal welfare and business owner workload. According to this, modern projects can be developed for business owners to minimize animal welfare and keep

animal welfare at the highest level and business owners can be informed and encouraged in this regard.

Generally used in barns, the floor material is concrete. Concrete is preferred in livestock farms due to its strength and ease of cleaning.

Barn sizes vary from 42 m² to 936 m². Considering the cow and calf factors that will give birth in most 1-3 enterprises group, it is thought to be insufficient. Ventilation in enterprises is not sufficient. Generally, ventilation is provided by using fan or ridge suitable for barn structure, in large scale enterprises.

A separate place for cows to give birth is never found in small businesses, it is has seen in half of medium-sized businesses and close to all large-sized businesses. Calves have special importance in business economics. Based on this, hygiene and optimum conditions should be ensured for healthy calves and space must be reserved for cows to give birth in the farms.

Milk averages, which are the main source of income in enterprises, were seen as 16.25 kg day⁻¹ in small enterprises and 20.1 kg day⁻¹ in large enterprises. Considering this in detail, it can be based on the differences between enterprises. They are; care, hygiene, animal welfare etc.

Statistically significance was determined between enterprise size and land size, barn type, calf partitions, delivery room status, milking system type.

The main aim of dairy cattle production enterprises is to obtain high quality, healthy, hygienic and high yield milk, but the study shows that many enterprises have deficiencies in this regard. In the scope of the study, no milking enterprises, which milk by hand were found, while many of the enterprises use mobile milking machines. It is seen that mobile machines are more primitive and simple than milking systems and milking systems are more developed in terms of hygiene.

In the light of the data obtained, we consider that the study will be beneficial for the sector-related planning in the district.

5. References

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