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The evaluation of feeding methods applied by beef and dairy cattle enterprises in Istanbul

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Abstract

In this study, enterprise structure, feedstuffs used in animal feeding, percentage of these feedstuffs, nutrition habits of animal in beef cattle and dairy cattle enterprises in Istanbul were determined. The research material in this study consisted of dataset obtained from 76 cattle enterprise managers by using questionnaire in Istanbul. The production type in 58, 22 and 4 of these enterprises were combined, dairy cattle and beef cattle , respectively. The percentage of breeds were 76.3% (58 enterprises) culture-bred, 18,4% (14 enterprises) mixed-bred and 6.6% (5 enterprises) and 6.6% (5 enterprises) domestic bred. Applied fattening methods were 40,8% (22 enterprise) open-, 37.0% (20 enterprise) half-open-, 22.2% (12 enterprise) closed- fattening method. In this study, the major part of these enterprises (88.2%) have been producing own feedstuffs. The percentage of feedstuff production in these enterprises were 41.8% (28 enterprise) alfalfa, 43.3% (29 enterprise) wheat, 58.2% (39 enterprise) barley, 38.8% (26 enterprise) oat, 34.3% (23 enterprise) vetch, 79.1% (53 enterprise) maize for silage. Silage has been made by themselves in 62 enterprises (81.6%), but it has been purchased in 14 enterprises (18.4%). It was determined that roughage: concentrate rate was substandard in 40.8% of fattening enterprises. Special feeding program has been applied by all of the enterprises, however, it was observed that reproduction, fertility and calf health were still the most important problem because of inadequate nutrition of calves from birth to weaning period.

Keywords: Istanbul, enterprise, feedstuffs, inadequate nutrition

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Introduction

In Turkey, dairy farming is the most important industry for country economics and for healthy and sufficient nutrition of people. There are 14.2 million cattle in Turkey (Anonymous 2015). In animal nutrition the most important factor is feed and feeding methods. 60-70 % of cost of animal production is feed (Anonymous 2011, Anonymous 2015). Therefore, feeding of animals with proper feed stuffs and ration is very important.

The use of quality and cheap roughage and balanced ration are the factors for the increase in animal production. However the most important problem in animal production in Turkey is the insufficiency in roughage. Although the requirement of roughage is 57 million tonne in our country, only 33 million tonne of this requirement can be supported (Anonymous 2015, Yolcu and Tan 2008).

Thirty percent of total meat production is consisted of beef cattle meat in the world, but this rate is in our country almost 90 % (Anonymous 2015). However, this rate will not change in the near future. Therefore, solutions should be developed for efficient and economics cattle production.

In addition to animal nutrition faults, the animal number per farms are also very low. The animal number is lower than 20 for 97 % of enterprise. In the terms of animal number, most of enterprises in Turkey are small family farms. Therefore economical animal production in Turkey very difficult because of the high cost of feeds, the difficulties in control mechanisms, price fluctuation in the cost of milk and meat production (Iptas et al. 1997).

Recently, although there were some survey studies in Turkey (Akman and Yalçinkaya, 2015; Aydın ve Sarıkaya, 2012; Bakır ve Demirel, 2001; Budağ ve Keçeci, 2013; Güngör ve ark., 2008; Soyak ve ark., 2007; Sürmen ve ark., 2008; Tugay ve Bakır, 2009), there were no any survey study in Istanbul province. In this study the data regarding feeding and nutrition methods were obtained from 76 cattle farms (beef and dairy) by using questionnaire in Istanbul province and this data were evaluated.

Materials and Methods

Data of the study were collected by using questionnaire between April and September 2016 in Istanbul province at 76 dairy and beef cattle farms. Questionnaires were consisted of 44 question. With this questionnaire, data related to animal number, capacity of farm, production, feed stuffs and rations were collected. No statistical analyses were used on obtained dataset and results were presented as numerical.

Results

According to the results of the survey conducted in 76 establishments in Istanbul and its environs, 50 (65.8%) of the enterprises operate meat and milk, 22 (28.9%) milk and 4 (5.26%) meat. 44 (57.9%) of the enterprises were large enterprises (enterprises with number of animals 50 and above), 22 (28.9%) were medium enterprises and 10 (13.2%) were small enterprises (number of animals) 20 and less)

Breeds of animals in farms were 76.3% (58 enterprises) of culture breed, 18.4% (14 enterprises) of mixed breeds and 6.6% (5 enterprises) of domestic breeds. Extensive fattening method was the most preferred method with 42.1% (22 enterprises) in 54 enterprises. In fattening enterprises, extensive method is applied in 40.8% (22 enterprises), semi- extensive method is 37.0% (20 enterprises) and intensive method is 22.2% (12 enterprises).

Roughage: concentrate ratios of the rations are varied in 54 dairy farms. In 24 enterprises (44.4%) 30% roughage / 70% concentrate feed rates, in 22 enterprises (40.8%) 40% / 60%, in 8 enterprises (14.8%) 25%: 75% it is used. The roughage / concentrate ratios of rations in the 72 farms where dairy farms are operated also differ on farm basis. It is 60%: 40% in 44 enterprises (61.1%), 50%: 50% in 25 enterprises (34.7%) and 40%: 60% in 3 farms (4.2%). As a feeding method, roughage and concentrate feed are given separately in 45 enterprises (59.2%) and together in 31 enterprises (40.8%).

The most important issue in livestock enterprises is fertility and calf health. The first insemination age in the farms; 1.3% of them inseminate heifers when they are 12 months old, 13.9% are 14 months old, 33.3% are 15 months old, 13.9% are 16 months old, 27.7% are 18 months old and 6.9% are 20 months old. The calving interval also varies between enterprises. According to the farm averages, calving intervals of animals in 2 enterprises (2.7%) was 11 months, in 25 enterprises 12 months (34.7%), in 16 enterprises was 13 months (22.2%), in 9 enterprises was 14 months (12.5%), in 14 enterprises was 15 months (19.4%), in 4 enterprises was 16 months (5.6%) and in 2 enterprises was 18 months (2.7%). All establishments implement a special feeding program for pregnant animals.

While 50 (69.4%) of the calving enterprises experienced fertility problems, 22 (30.6%) enterprises did not experience fertility problems during the study period. The prevalence of foot problems, which are

closely related to nutrition and fertility, are; 51.4%.

Live body weights of calves born in farms vary between 25 kg and 50 kg. Live body weight of calves born in 84.7% of farms is in the range of 35-50 kg. The body weight of the calf less than 35 kg was observed in 15.3% of enterprises. After the birth, 48 (66.7%) kept calves in special compartments, 23 (31.9%) kept together with other calves and 1 (1.4%) kept with their mother. Colostrum was given in the first 3 hours in 91.7% of the enterprises with a calf bottle and by suckling its mother in 8.3% of the enterprises. The age of weaning of calves varies between farms. The age of weaning of calves was 2 months (41.7%) for 30 enterprises, 3 months (54.2%) for 39 enterprises and 4 months (4.1%) for 3 enterprises. The first roughage supplementations in enterprises of 5.6%, 22.2%, 4.2%, 1.4%, 11.1% and 4.2% were in first month, second month, third month, sixth month, second week and third week, respectively. The age of first calf feeding after calves was also different among the farms. The first concentrate feeding in enterprises of 13.9%, 2.8%, 5.6%, 5.6%, 52.8%, 13.9%, 5.6% were in first month, second month, fourth month, second week, third week and first week of age, respectively. The mortality rates of calves also vary widely between farms. In 10, 8, 6, 4, 9, 12 and 2 of the enterprises, the mortality rates were 1%, 2%, 3%, 4%, 5%, 10% and 20%, respectively. However, in 21 enterprises, there were no any mortality. One of the questions asked to the enterprises was the incidence of calf septicemia in the last year. Calf septicemia was observed in 55.5% (40) of the enterprises, whereas septicemia was not observed in 44.5% (32).

Daily milk yields in dairy farms vary between 20 and 30 liters. Enterprises received veterinary services from private veterinary clinics were 85.5% (65 enterprises), and received from provincial and district directorates of agriculture were 14.5% (11 enterprises). Metabolic diseases (milk fever, acidosis, ketosis) were seen in the last one year in 9% (44 enterprises). There were no any metabolic diseases in 42.1% (32 enterprises) of the enterprises.

All enterprises recorded their data and parameters such as calf birth times, calf live body weights, calf and animal mortality rates, milk and meat yields were recorded by the staffs.

In our study, we wanted to learn general thoughts about animal husbandry by asking an open-ended question besides the related and independent questions in order to determine the situation in the enterprises. The companies that answer these questions were happy with the questionnaire, but they suggest that academicians working in the departments of animal husbandry of universities to be more interested in the field, to see the problems of animal husbandry and to produce solutions together with the enterprises.

Discussion

In this study conducted in Istanbul, 75.0% of the 76 enterprises surveyed use culture breed, 18.4% use hybrid breeds and 6.6% use domestic breeds. According to the data TSI (Turkey Statistical Institute, Animal Production Database 2015), 82 909 head of cattle are present in Istanbul, of these animals, 36762 are the culture breed, 27 783 are crossbreed and 6614 are native breeds (2015). In terms of the proportion of culture and hybrid breeds in the presence of cattle population in Turkey, the major differences are observed among regions. The regions with the lowest proportion of native genotypes are Marmara and Aegean regions, which are considered as the most developed regions. According to TSI data, only 6.3% of the cattle in Istanbul is consisted of domestic breeds. These results were agree with the values obtained in our survey.

According to the findings of the research, 65.8% of the livestock enterprises in Istanbul are meat and milk enterprises, 28.9% are only dairy enterprises and 5.26% are only meat enterprises only. According to 2014 TSI data, the majority of the products (%80) obtained from milk are used as the majority (80%) as milk and cream. According to the distribution of raw milk in our country, 54% is delivered to modern enterprises and dairy farms, 35% is used on the farm (calf feeding) and 11% is consumed as street milk (TSI, Animal Production Database 2014). In Turkey, the enterprises having less than 20 cattles is 83.6% level. The rate of enterprises having 20-49 cattles is 15.1% and the enterprises having 50 or more animals is very low (1.4%) (Benli 2007). In the province of Istanbul, these rates were 13.2%, 28.9% and 57.9%, respectively in the present study. This results were different from the general situation in Turkey do to the establishment of the big cattle enterprises in Marmara region since 1980 (GAP report, Dec. 2014).

In this study, most of the enterprises (88.2%) produce forage plants themselves. 28 of them (41.8%) were alfalfa, 29 of them were wheat (43.3%), 39 of them were barley (58.2%), 26 of them were oat (38.8%), 23 of them were vetch (34.3%) and 53 (79.1%) planted silage maize. Silage, which is used extensively in dairy cattle nutrition, is made by themselves in 62 (81.6%) of the farms and is supplied externally in 14 (18.4%) of them. In a survey conducted in the province of Tekirdağ, 70% of enterprise owners stated that they produced plant and 30% supplies externally. While 57% of business owners grow alfalfa and vetch as forage crops, 43% do not produce forage crops. 52% of the enterprises produce their own roughage, 48% of the enterprises purchased. While 75% of the enterprises make the silage themselves, 25% purchased. (Soyak A., M.I. Soysal, Gurcan, E.K., 2007). The production of feed stuffs and roughages used in animal nutrition by enterprises is important for an economical and efficient livestock. While 52.6% (40 enterprise) of the surveyed enterprises met their roughage needs by their own production, 26.3% (20 enterprises) supplied commercially and 21.1% (16 enterprises) purchased. While 17 (22.4%) of the enterprises met their need for concentrate feed by their own production, 16 (21.1%) purchased commercially. 43 (56.6%) enterprises both use their own facilities and buy from outside. According to the study by Soyak et al., 65% of the enterprises met the concentrate feed by purchasing, 23% from the cooperator and 12% from their own facilities. In another survey study, 79.41% of the enterprises received concentrate feed requirement from feed factories, 17.4% used feed produced by them and 2.94% purchased feed stuffs from outside and prepared their rations (Akman B., Yalçinkaya. İ., 2015).

The enterprises used different forages in their rations. 88.2% straw, 80.3% corn silage, 63.2% clover hay, 59.2% meadow hay, 22.4% beet pulp, 21.1% vetch dry grass, 17.1% use sainfoin and 3.9% triticale forage. In a survey conducted in the province of Van, the rate of using alfalfa from roughage in animal husbandry enterprises was found to be 66%, 35% of sainfoin and 45% of meadow hay (Budağ C., Keçeci Ş., 2013). According to the study by Togay et al. in the province of Giresun, the use of roughage in rations were determined as meadow grass 94.9%, alfalfa 30.8%, sainfoin 3.5%, corn silage 1.3%, straw 75.9%, vetch hay grass 30%. In another survey conducted in Van province, it was found that the roughage used in cattle farms were hay, alfalfa, sainfoin and meadow hay (Şahin et al. 2008). Considering the differences between the regions, it was determined that the use of corn silage was high in Istanbul, but the varieties and uses of other forages were similar. 52% of the enterprises produced their own roughage, 48% enterprises purchased and 75% of the enterprises make their own silage.

Roughage / concentrates were varied among 54 enterprises. Roughage / concentrates rates were 30% / 70% in 24 enterprises (44.4%), 40%-60% in 22 enterprises (40.8%), 25%-75% in 8 enterprises (14.8%). In a study conducted in Van province, roughage / concentrate feed rates were %40 / %60 (66% of enterprises), %30 / %70 (%20 of enterprises) and %20 / %80 (%14 of enterprises) (Budağ C., Keçeci Ş., 2013). Also, in Bayburt this rate were determined 57% / 43% (Özkan and Erkuş 2003). The rate of concentration feed in a ration is the most important criteria that effects the profitability and output in fattening (Koknaroğlu et al. 2005).

In the present study the roughage / concentrate feed ratios were also vary among enterprises: 60% / 40% in 44 enterprises (61.1%), 50% / 50% in 25 enterprises (34.7%), 40% / 60% in 3 farms (4.2%). Feeding methods in these enterprises were roughage and concentrate feeding separately in 59.2% (45 enterprises), roughage + concentrate feedmix in 40.8% (31 enterprises). Average daily milk production in these enterprises were ranged 20-30 liters. Average daily milk productions were 20 litres for 13.9% (10 enterprises), 25 liters for 63.9% (46 enterprises), 30 liters for 13.9% (10 enterprises) and over 30 litres for 8.3% (6 enterprises) of the enterprises. Roughage / concentrate feed ratio was 60% / 40% in enterprises with daily milk yield of 20-25 liters. It was found that the ration used in the farms in this group, where the milk yield was not very high, had higher forage ratio. The higher the milk yield, the lower the roughage / concentrate feed ratio.

Conclusion

In conclusion, it was found that large enterprises were more conscious about herd management and feeding, followed current developments in calf feeding. However, there were problems in calf health in small enterprises

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