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Feed Usage and Cattle Feeding Practices in Cattle Enterprises in the Eastern Anatolia Region: Case of Central County of Erzincan Province

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ABSTRACT

This study was conducted to determine the common animal feeding practices as well as types of feeds used in the cattle enterprises located in the central county of Erzincan province. For this purpose, data were obtained by conducting a face to face survey with 401 dairy cattle breeders. Percentages of the enterprises which moved their animals to pasture in March, April, May and June were respectively 2.6%, 56.7%, 39.3% and 1.3%. Cattle breeders tended generally to buy concentrate feed from feed mills, while majority of them (74.8%) grew forage crops in their own enterprises. The most commonly used roughage types were wheat-barley straw (95.8%), alfalfa hay (78.1%) and meadow hay (52.1%), while crushed barley (92.0%), wheat bran (78.6%), dairy cattle feed (68.3%) and cattle fattening feed (50.6%) were prominent as concentrate feeds. It was also determined that feeds in the majority of the enterprises (97.5%) were distributed to animals by hand. Data regarding weaning age of calves indicated that 0.6% of the enterprises weaned their calves at one month of age, 10.9% at two months of age, 79.7% at three-four months of ages, 5.4% at five-six months of ages and 3.4% at seven months of age or older. In conclusion, the awareness of the breeders about updated cattle feeding practices and especially for silage corn planting as well as usage of maize silage for nutrition of animals must be increased and the incentives and financial supports in this respect has to be raised for profitable cattle husbandry in central county.

Doğu Anadolu Bölgesindeki Sığırcılık İşletmelerinde Yem Kullanımı ve Sığır Besleme Uygulamaları: Erzincan İli Merkez İlçesi Örneği

MAKALE BİLGİSİ

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ÖZ

Bu araştırma, Erzincan ili merkez ilçede yer alan büyükbaş hayvan işletmelerinde yaygın olan hayvan besleme uygulamaları ile kullanılan yem çeşitlerini belirlemek amacıyla yapılmıştır. Bu amaçla 401 süt sığırı yetiştiricisi ile yüz yüze anket yapılarak veriler elde edilmiştir. Mart, Nisan, Mayıs ve Haziran aylarında hayvanlarını meraya çıkaran işletmelerin oranları sırasıyla %2,6, %56,7, %39,3 ve %1,3'tür. Sığır

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Anahtar Kelimeler

Sığırlar
Buzağılar
Yemler
Besleme
Erzincan

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yetiştiricileri genellikle yem fabrikalarından kesif yem satın alma eğilimindeyken, çoğunluğu (%74,8) kendi işletmelerinde yem bitkisi yetiştirmektedir. En sık kullanılan kaba yem türleri buğday-arpa samanı (%95,8), yonca samanı (%78,1) ve çayır samanı (%52,1) iken konsantre yem olarak ezilmiş arpa (%92,0), buğday kepeği (%78,6), süt sığırı yemi (%68,3) ve büyükbaş besi yemi (%50,6) öne çıkmıştır. Ayrıca, işletmelerin büyük çoğunluğunda (%97,5) yemlerin elle hayvanlara dağıtıldığı da saptanmıştır. Buzağıların sütten kesilme yaşlarına ilişkin veriler işletmelerin %0,6'sının buzağılarını bir aylıkken, %10,9'unun iki aylıkken %79,7'sinin üç-dört aylıkken, %5,4'ünün beş-altı aylıkken ve %3,4'ünün yedi aylıkken veya daha büyük yaşta sütten kestiğini göstermiştir. Sonuç olarak, yetiştiricilerin güncellenmiş büyükbaş hayvan besleme uygulamaları ve özellikle silajlık mısır ekiminin yanı sıra hayvanların beslenmesinde mısır silajının kullanımı konusunda farkındalığın artırılması ve bu konuda merkez ilçede karlı büyükbaş hayvancılığa yönelik teşvik ve mali desteklerin artırılması gerekmektedir.

Introduction

In recent years, world population has enlarged geometrically in response to the arithmetic increasing of the food production in the World (Özgür, 2017). As a consequence of that, especially the current supplies of animal protein and energy remained inadequate to meet requirements of humans in many countries. Therefore, these circumstances has led to protein-energy malnutrition which resulted from insufficient intake of biologically necessary nutrients (Lam, 2018).

Improving the environmental conditions of the farm animals including the use of quality roughage and concentrate feed sources is one of most important prerequisites of efficient animal husbandry. Therefore, rational nutrition in livestock enterprises must be applied in order to obtain the desired yield from animals with high genetic potential (Yılmaz, et al. 2020). Nutrition of the farm animals influences significantly growth, performance, reproduction, immune system and products quality of the animals. Positive effects of ideal nutrition of the animals are provided by availability of nutrients in the feeds, kinds of feeding system and the level of feeding management (Kırkpınar and Açıkgöz, 2018). Although the optimum feeding of the animals was highly important for livestock production, it was indicated that farm animals in Turkey were not generally fed enough due to insufficient production of high quality forage crops besides few areas of fruitful and quality pastures and meadows by Bakır and Demirel (2001).

Feed cost is also the major part in the entire cost of animal production. Since feeds contribute to up to 60-80% of the total costs in the production of the livestock products, the economical production depends on a very large extent by efficient usage of the feeds (Igbang et al., 2021). The effectiveness of utilizing the available feed resources is especially significant for animal performance as well as increasing productivity of the livestock production.

The usage of quality forage crops for cattle feeding will lead to decreasing the use of costly concentrate feed in the cattle enterprises and increasing of their profits. Additionally,

the high ability of cattle for utilizing cellulose-rich feed increases the significance of the cultivation of fodder crops that provides cheap and quality forages. Thus, it is crucial for cattle breeders to cultivate the required amount of roughage in their own enterprises for profitable animal farming (Güler et. al. 2016; Diler et al., 2018).

Eastern Anatolia Region has the largest share (56.80%) in terms of meadows and pasture areas in our country. More than half of the total meadow areas and more than 1/3 of the total pasture areas exist in this region. When the quantities of meadow and pasture areas in the geographical regions of Turkey are considered, the Eastern Anatolia Region takes the first place with 37.53%, the Central Anatolia Region is in the second place with 31.27%, and the Black Sea Region takes the third one with 10.38%. In Eastern Anatolia Region, the total area of meadows along with pastures is 5 485 495 ha, and the total amount of dry hay produced annually in these areas is 4 567 510 tons. In Erzincan province, which is one of the 14 provinces of the Eastern Anatolia Region, the total area of meadows and pastures is 449 433 ha and it ranks fourth in terms of total area of meadows and pastures (Okcu, 2020). The amount of the meadow and pasture areas also point out high potential of the livestock production in Erzincan province. Additionally, 3 710 748 heads cattle are raised in the province, and number of cattle existing in Erzincan province is 122 660 heads in 2020 year (TUİK, 2021).

Up to now, any research investigating current situation, problems regarding cattle feeding as well as feeding habits and feeds used in the cattle enterprises located in central county of Erzincan province was not carried out. Therefore, this study was undertaken to determine the common animal feeding habits and practices as well as types of feeds in the cattle farms. Furthermore, results of the research will reveal the existing cattle feeding problems of the enterprises in central county of Erzincan province and they could suggest solutions for them.

Material and Method

The material of the study is obtained from 401 cattle enterprises operating in central county of Erzincan province. A face-to-face survey was conducted with owners of the enterprises which were randomly selected by simple random sampling from 2003 cattle enterprises in the central county. The cattle breeders in Briketçiler-Mezbaha-Altı location, and in 11 towns (Akyazı, Çukurkuyu, Çağlayan, Demirkent, Geçit, Kavakyolu, Mollaköy, Ulalar, Yaylabaşı, Yoğurtlu ve Yalnızbağ) as well as in 59 villages connected to the central county of Erzincan province was included into the survey.

In determining the random minimum sample size, the method used in cases where the variance is unknown, the population is limited, and there are qualitative variables related to probability, and the formula is given below (1). Here, the margin of error was 5% and the confidence level was 95% (Arıkan, 2007).

$$n=[N.t^2.p.q]/[(N-1)D^2+t^2.p.q] \quad (1)$$

In this formula;

n=Sample Size,

N=Population Size (N=2003),

D= Margin of Sampling Error (0.05),
t= Table Value (t=1,96, α=0,05),
p= Population Proportion (0.5),
q= 1-p

As a result of the calculation of the sample size, the minimum sample size was determined as about 322. The minimum number of enterprises calculated in this study was increased by 79 units and this survey was carried out with owners of the 401 cattle enterprises located in the central county of Erzincan province. The values obtained from the surveys were recorded by entering data into MS Excel program and percentage values were calculated using the information here. The effects of the educational status of the owners of the enterprises (illiterate, literate, Primary School graduate, Secondary School graduate, High School graduate and University graduate) and number of animals (1-15, 16-30, 31-45, 46-60 and more than 61 heads) raised in the enterprises on the parameters investigated in the current study was analyzed statistically by using the Chi-Square test in the SPSS package program (SPSS, 2013).

Results and Discussion

The Dates of Moving Cattle to Pasture or Plateau

As in the Eastern Anatolia Region, pasture-based animal husbandry was generally observed in Erzincan province. Results of the present study revealed that 78.0% of enterprises in the central county move their animals to pasture. Percentages of the enterprises which moved their animals to pasture in March, April, May and June were respectively 2.6%, 56.7%, 39.3% and 1.3% (Figure 1). In a study carried out in Hınıs county of Erzurum province, Diler et al. (2016) reported that cattle were moved to pasture in April (25.0%), May (37.0%) and June (37.0%), and the overall percentage of enterprises which utilized the pasture was 99.0%. Similarly, percentages of the farmers who sent their cattle to pasture in

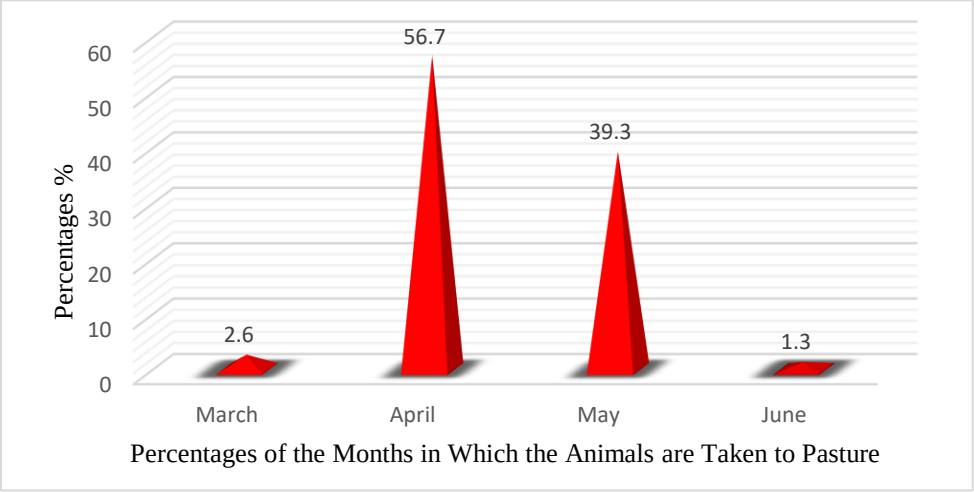

Figure 1: Percentages of the months in which animals were taken to the pastures
Şekil 1: Hayvanların meraya çıkış aylarının yüzde oranları

Kahramanmaraş, Yakutiye county of Erzurum province and Van provinces respectively was reported as 99.0%, 86.8%, 76.2% by Kaygısız and Tümer (2009), Çapadağ (2017), Şahin and Yılmaz (2008). On the other hand, it was determined that the percentage of enterprises that moved their cattle to plateaus was 23.5%, while the ratio of enterprises that did not send animals to plateaus was 76.5% in central county of Erzincan province. Percentages of the enterprises which moved their animals to plateaus in March, April, May, June and July were respectively 1.1%, 11.0%, 56.0%, 30.8% and 1.1% (Figure 2). On the contrary of the findings of the present study, more than half of breeders (58.0%) in Hınıs county of Erzurum province and 77.8% of those in Yakutiye county of Erzurum province moved their cattle to plateaus in June (Diler et al. 2016; Çapadağ, 2017).

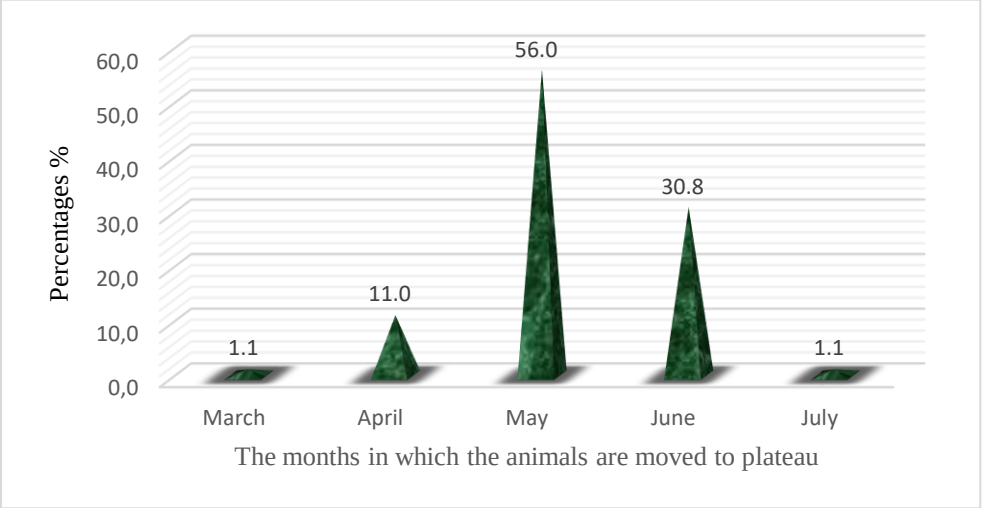

Figure 2: Percentages of the months in which animals were taken to the plateau.
Şekil 2: Hayvanların yaylaya çıkış aylarının yüzde oranları

Cultivation of Fodder Crops

In the central county of Erzincan province, percentages of enterprises which used wheat-barley straw, meadow hay, dried alfalfa hay, dried sainfoin, dried vetch hay, corn silage and sugar beet pulp as roughage feeds were respectively as 95.8%, 52.1%, 78.1%, 32.4%, 31.2% 29.2%, 5.7% (Figure 3). Likewise, roughages utilized for cattle feeding in Blacksea Region during winter season were also reported as wheat straw (50.5%), alfalfa dried sainfoin (11.4%), dried wetch (6.9%), silage (7.1%), sugar beet pulp (3.8%), meadow hay (9.1%), other hays (5.3 %) by Sürmen et al. (2008). Alfalfa, sainfoin, vetch, oat, rye, corn and triticale were generally cultivated in the enterprises that grow fodder crops in the central county of Erzincan province. It was also determined that alfalfa was in the first place among the most widely cultivated forage crops. Similarly, Diler et al. (2018), Bakır and Kibar (2019) and Sezer et al. (2020) reported that the highest percentage of the forage crops produced in the cattle enterprises in Narman county of Erzurum province, in Muş province and in Nevşehir province belonged to alfalfa. On the other hand, commonly produced forage crops in Tekirdağ and Kırklareli provinces were noted as corn for silage and alfalfa by Öztürk et al. (2019). Diler et al. (2016) reported that 80.0% of enterprises grew sainfoin as forage crop in Hınıs county of Erzurum province. However, the most commonly cultivated fodder crops in Isparta and Burdur provinces were corn (60.0%) and alfalfa (71.4%) respectively (Boyar and Yumak,

2000). Likewise, Bogdanovic et al. (2012) reported that dairy cattle enterprises in Serbia used dry grass hay, dry alfalfa and corn silage as common coarse feed. Similarly, alfalfa, dry meadow hay and dried sainfoin were commonly used in the cattle enterprises in Tokat province (Ildız, 1999), while Savran (2003) stated that 80.0% of the cattle farms in Çanakkale province cultivated oat as roughage feed.

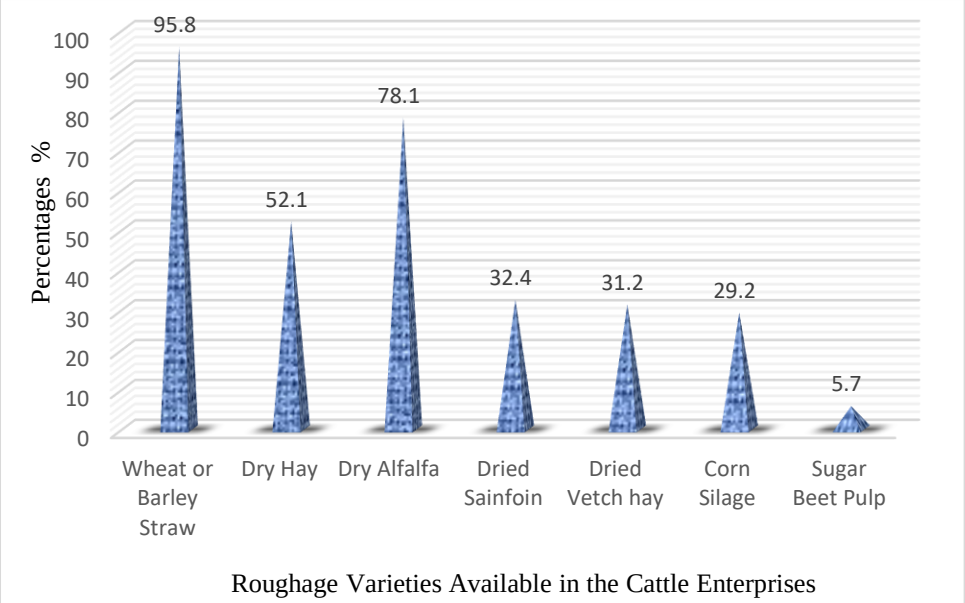

Figure 3: Percentages of roughage varieties available in the enterprises
Şekil 3: İşletmelerde mevcut olan kaba yemlerin yüzde oranları

In the present study, it was found out that 38.1% of respondents utilized corn silage for feeding of their cattle, and 61.9% did not use silage. Similarly, Soyak et al. (2007) also reported that 35.7% of the cattle farms in Tekirdağ used silage for animal feeding. However, 11.7% of respondents in Kars province utilized from silage for cattle feeding (Demir et al. 2013), while 21.4% of dairy farms in Yalova used silage as course feed (Bakır and Han, 2014). Unlike these results, in a study investigating the management practices related to udder health in the early lactation period of milking cows, it was reported that grass silage containing 31.0% of dry matter was used in all of the farms (Nyman et al. 2008).

In the central county of Erzincan province, it was determined that percentage of enterprises utilizing from silage for 1-2 years was 9.4%, 16.8% of the respondents has been using silage for 2-4 years, 26.8% of farmers has been producing silage for 4-6 years, and 47.0% has been feeding their cattle with silage for longer than 6 years. It was also found out that silage using enterprises for more than 6 years had the highest proportion, since most of the enterprises in this county have been planting silage corn for long time. However, the results of a study conducted by Çapadağ (2017) in Yakutiye county of Erzurum province were indicated that the percentage of enterprises using silage for longer than seven years was 26.2%. Additionally, the percentage of cattle enterprises fed their cattle with corn silage for five years was 23.1% as well as the proportion of farms utilized from silage for 3 years was 21.5%.

According to the findings of the present study, corn silage was generally used for feeding of animals such as lactating cows (34.2%), dried cows (8.7%), heifers (14.7%), old

calves (14.5%), young fattening bulls (16.5%) and fattening heifers (8.7%) (Figure 4). Furthermore, it was determined that the educational status of the owners of the enterprises and the number of animals raised in the farms had an insignificant effect on the use of silage.

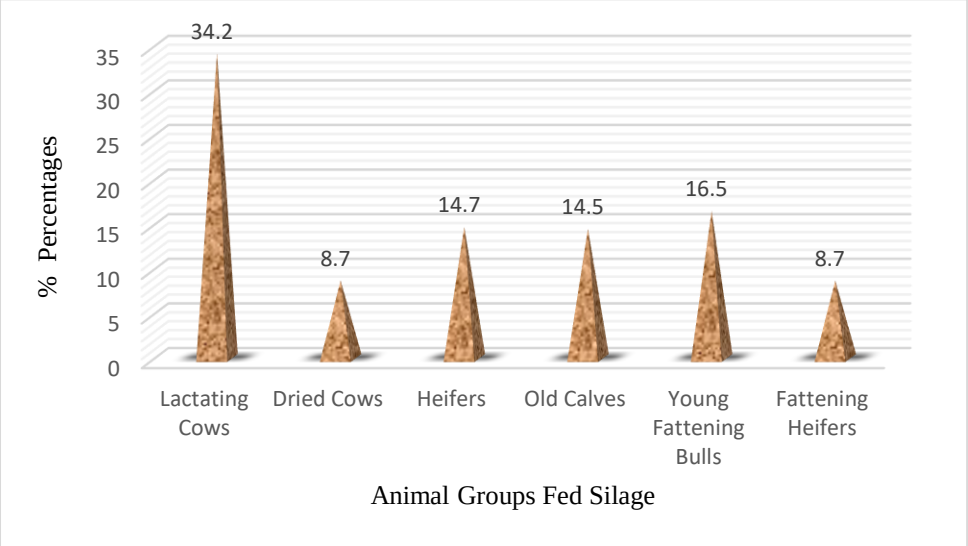

Figure 4: Percentages of silage-fed cattle type groups
Şekil 4: Silajla beslenen sığır çeşit gruplarının yüzde oranları

Sources of Roughage and Concentrate Feed Supply

In central county of Erzincan province, 74.8% of owners of the enterprises sowed forage crops on their own farms, while 25.2% of those do not produce forage crops in their enterprises. Similarly, more than 3/4 of the cattle enterprises in Antalya, Iğdır, Kars, Muş, Tekirdağ, Kırklareli provinces as well as Narman county of Erzurum province grew fodder crops, that they needed, on their own farms (Kum, 2006; Yeşil, 2015; Demir et al., 2013; Bakır and Kibar, 2019; Öztürk et al., 2019; Diler et al., 2018). On the contrary of results of the present study, findings of other studies carried out in different regions of Turkey revealed lower percentages (47.2% in Konya 52.0 in Tekirdağ, 61.2% in Yalova, 16% in Hınıs county of Erzurum province) of enterprises which grew their own forage crops (Uzal and Uğurlu 2006; Soyak et al. 2007; Bakır and Han, 2014; Diler et al. 2016).

It was also determined that percentage of farms in the central county of Erzincan province that grew their own fodder plants was significantly ($P<0.05$) influenced by the number of animals raised in the enterprises. In other words, the number of farmers engaged in the production of fodder crops has raised along with increasing of the number of animals in their enterprises (Figure 5).

Sources of concentrate feed supply, another type of feed used in feeding of animals at the enterprises, was also investigated in this research. Results of the current study indicated that 8.1% of enterprises produced their own concentrate feeds in their farms while 81.5% of those purchased it from feed mills. In addition, 7.6% of the cattle breeders bought the concentrate feed from feed mills whenever their needs were not met by their production, and 2.8% of those provided it from Agricultural Credit Cooperatives. The result is in accordance with

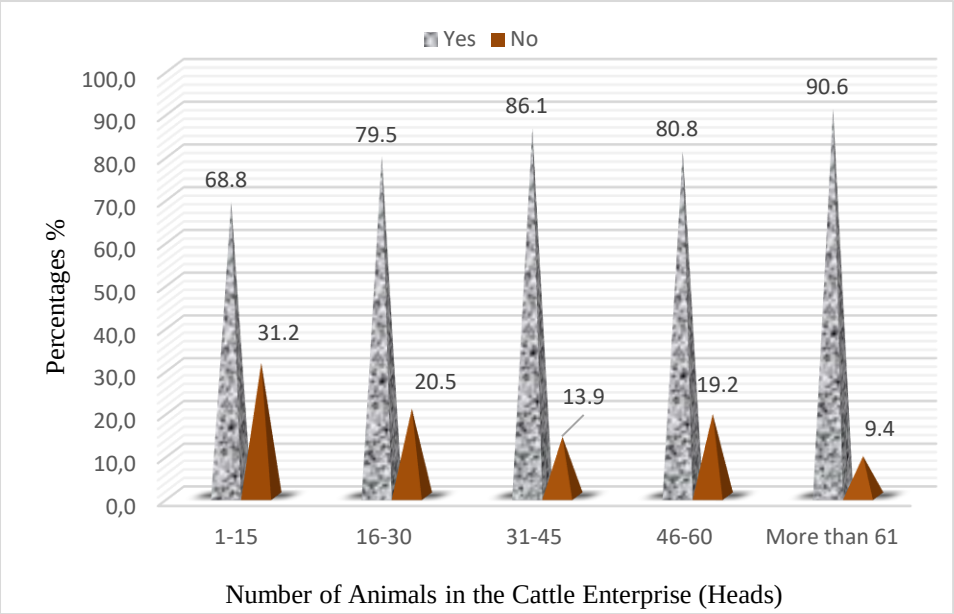

Figure 5: Percentages of enterprises that grow fodder crops according to the number of animals

Şekil 5: Hayvan sayılarına göre yem bitkileri yetiştiren işletmelerin yüzde oranları

findings of Bakır and Han (2014) who studied the structural features of dairy cattle breeding enterprises in Yalova province. They reported that 87.1% of enterprises purchased concentrate feeds from feed dealers, while 10.9% and 1.9 % from unions and cooperatives as well as feed mills respectively. Similarly, results of a study conducted in Tekirdağ province revealed that 65.0% of concentrate feed was purchased from feed mills, 23.0% obtained from cooperatives, and 12.0% produced it by themselves (Soyak et al., 2007). Likewise, the majority of cattle breeders in Hınıs county of Erzurum province preferred feed factories (64%) for the supply of concentrate feed, while the percentage of farmers who preferred Agricultural Credit Cooperatives was extremely low (2%). Percentage of those who produced concentrate feeds in their own enterprises was also determined as 19% by Diler et. (2016). Kaygısız and Tümer (2009) and Daş et al. (2014) stated that concentrate feed is mostly acquired from outside the farm, while Dou et al. (2001), Önal and Özder (2008), Bogdanovic et al. (2012) and Tilki et al. (2013) was indicated that the majority of concentrate feed is met from within the enterprise. On the other hand, Soyak et al. (2007) and Sezer et al. (2020) found out respectively that 65% and 69.5% of breeders purchased the concentrate feeds from local feed dealers.

In the present study, It was also revealed that the effect of the number of animals available in the enterprises on the source of concentrate feed supply was not statistically significant (Figure 6).

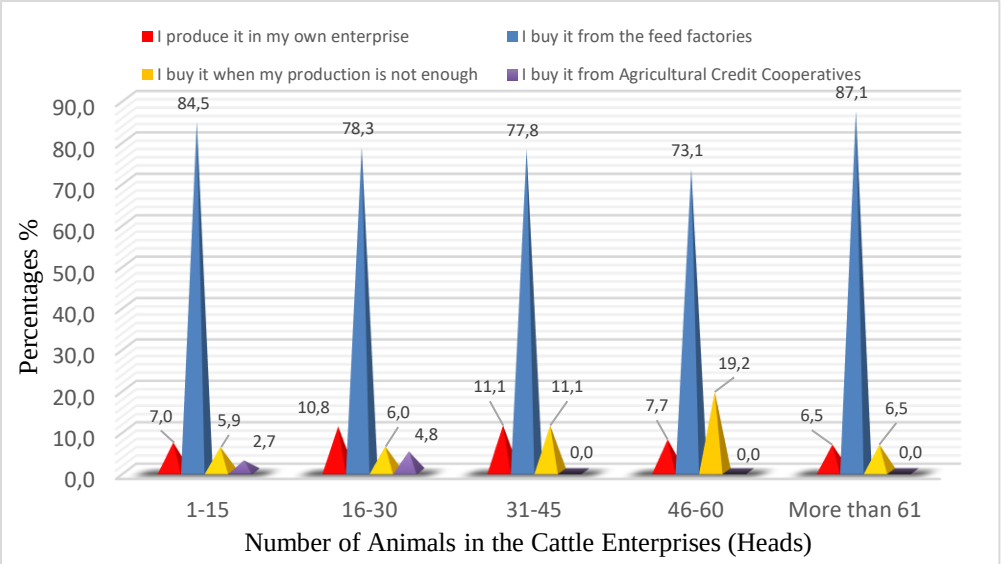

Figure 6: Distribution of sources of concentrate feed supplies according to the number of animals available in the enterprises

Şekil 6: Hayvan sayılarına göre kesif yemin sağlandığı kaynakların işletmelere dağılımı

Types of Concentrate Feed Used in the Cattle Enterprises

In the present study, it was determined that the percentages of types of concentrate feeds used in the cattle enterprises were 92.0% crushed barley, 78.6% wheat bran, 68.3% dairy cattle feed, 50.6% cattle fattening feed and 19.0% wheat (Figure 7). Commercial feeds including dairy cow feed and cattle fattening feed are the most commonly used concentrate feeds in various regions of Turkey like central county of Erzincan province. Results of studies

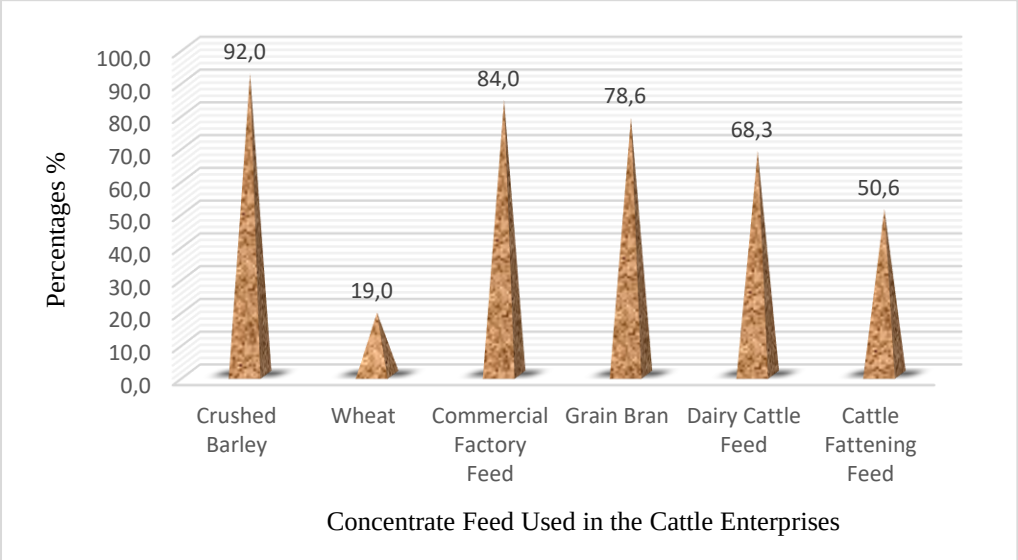

Figure 7: Percentages of the concentrate feeds used in the enterprises

Şekil 7: İşletmelerde kullanılan kesif yemlerin yüzde oranları

conducted by Tugay and Bakır (2008), and Kaygısız and Tümer (2009) indicated that commercial dairy cow feed is generally used as concentrate feed in cattle farms located in the

Giresun and Kahramanmaraş provinces. Similarly, Uçak (1992) has also point out that 63.33% of the enterprises raising imported cattle in Samsun province fed the animals with commercial factory feed. Likewise, it was determined by Diler et al. (2016) that commercial concentrate feed is used in 64% of the cattle enterprises located in Hınıs county of Erzurum province, and the use of barley and wheat bran is at a very low level. However, crushed barley (34%), cattle fattening feed (23%) and dairy cattle feed (22%) are kind of the concentrate feeds which were generally used as concentrate feed in the enterprises in the Narman county of Erzurum province (Diler et al., 2018).

Cattle Feeding Techniques

In the present study, it was determined that 49.1% of the farms fed the animals twice a day, 47.6% three times a day, 3.3% more than three times a day. In addition, it was found out that first roughage and then concentrate feed was given to cattle in 5.9% of the enterprises, mixture of the roughage and concentrate feed together was offered to animals in 88.5% of the farms and first concentrate feed then roughage was given to cattle in 5.6% of the enterprises (Figure 8).

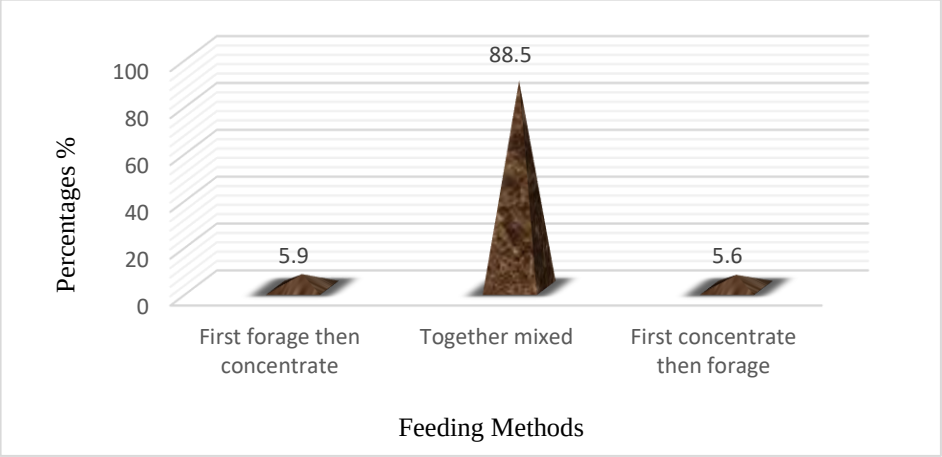

Figure 8: Percentages of the methods of feeding animals
Şekil 8: Hayvanları yemleme yöntemlerine ait yüzde oranlar

In the studies conducted in other regions of Turkey, Önal and Özder (2008) indicated that 63.2% of the breeders fed cattle twice a day, while 31.6% fed three times. Similarly, Çapadağ (2017) stated that 70.6% and 27.7% of the surveyed enterprises fed the animals twice a day and three times a day respectively. Furthermore, first coarse and then concentrate feed in these farms was usually (47.9%) given to the animals. In addition, it was indicated that 74.8% of enterprises in Konya feed their animals twice a day, and 70.6% of those used mixed ration for the cattle nutrition (Akkuş, 2009). Another study conducted in Ankara and Aksaray provinces reported that mixed feed was given together at two times a day in 71.0% of enterprises in Ankara, 51.4% of enterprises in Aksaray at three times a day, and coarse feed and concentrate feed were given together at 67.7% of enterprises in Ankara, and 64.8% in Aksaray provinces (Tatar, 2007).

Feed distribution to animals was carried out manually in 97.5% of these enterprises in central county of Erzincan province while distribution of the feeds was performed with a

tractor in 2.6% of them. As it can be seen, since the modern system has not been fully implemented in the cattle breeding enterprises in the central county and the mechanization is not at the desired level, the percentage of the manual distribution of the feeds was found to be quite high.

Likewise, Önal and Özder, (2008) reported that feed distribution was carried out manually in 98.2% of the enterprises in Edirne province, and tractor distribution was carried out in 1.8% of them. Bayraktar et al. (2010) stated that the distribution of feed in the cattle enterprises in the Ahlat and Adilcevaz counties of Bitlis province was carried out by using tractor trailers in 2 farms while feeds were distributed manually in the other 21 enterprises. It has also been determined that the effects of the number of animals in the enterprises and the educational status of the owners of the enterprises on the feed distribution method to the animals were not statistically significant**.**

In a vast majority of the enterprises in the central county of Erzincan province (95.0%), cattle were fed based upon farmers' own knowledge and experience, in 4.2% of the enterprises in direction of the advices of Veterinarians. It was also determined that 1.7% of the breeders received information for cattle feeding from unions and cooperatives, and 0.7% of those followed the recommendations of the feed mills while 0.5% of those fed their cattle according to the advices of Agricultural Engineers (Animals Scientists) (Figure 9). The majority of the owners of the farms fed animals based on their own experiences in central county of Erzincan province. This result was in agreement with findings of Elmaz et al. (2010) and Çapadağ (2017) who reported that 92.6% and 86.6% of the breeders fed the

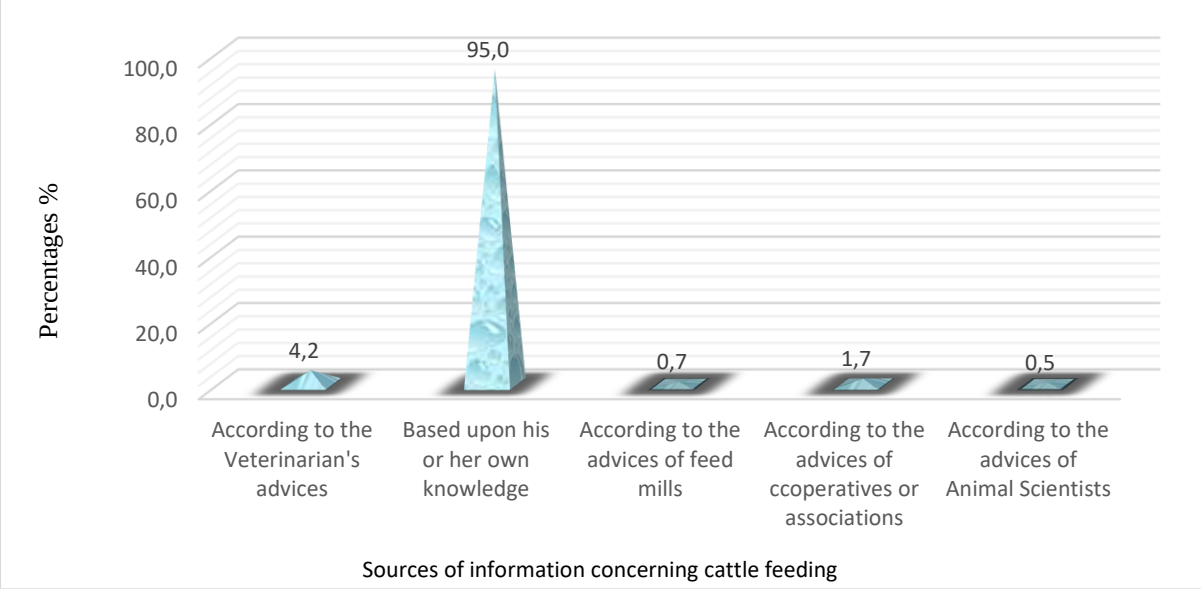

Figure 9: Percentages of sources of information concerning cattle feeding
Şekil 9: Sığırların yemlenmesi ile ilgili bilgi kaynaklarının yüzde oranları

animals according to their own conventional knowledge in Burdur province and Yakutiye county of Erzurum province respectively. Similarly, it was reported by Demir et al. (2013) that 72.2% of dairy cattle farms in Kars province were fed in line with their own knowledge and experience.

Calf Feeding Practices

The periods of starting to give roughage and calf starter (concentrate feed) to young animals after birth were also investigated in cattle enterprises in central county of Erzincan. Most of the cattle breeders (36.1%) started to give roughage and concentrate feed 8 weeks after birth while percentages of others who initiated to feed dry feeds to calves in one, two, three, four, five, six and seven weeks of postpartum were respectively 14.9%, 11.3%, 11.0%, 18.9%, 2.5%, 3.7% and 1.7%. On the other hand, Tatar (2007) indicated that 24.6% of the enterprises in Ankara started to give calf concentrate feed and dry hay to calves in the first week and 26.2% in the second week, while these values in Aksaray were 28.8% and 20.9% respectively. Age of first time feeding concentrate and roughage to calves in Konya province was reported as 23.3 days of postpartum by Akkuş (2009) while roughage and concentrate feed were first offered to calves at average of 24.5 days old in Yakutiye county of Erzurum province (Çapadağ, 2017). The effect of the educational status of the owners of the enterprises on the periods of starting to give roughage and calf starter to young animals after birth was found statistically insignificant in the current study**.**

The percentages of enterprises that the first time calves were given water after birth were found to be 27.0% immediately after birth, 20.3% after one week, 11.3% after two weeks and 41.4% after three weeks. However, in 44.2% of the enterprises in Yakutiye county of Erzurum province, water was first introduced to the calves between 1 and 10 days of postpartum while 21.3% and 28.6% of these respectively were given water first time between 11 and 20 days old and following 21 days of postpartum (Çapadağ, 2017). On the other hand, Tatar (2007) stated that 61.7% of the enterprises in Ankara and 73.2% in Aksaray started to give water to the calves within the first week, and there are also enterprises in both provinces that do not give water to the calves until the age of 20 days. The effect of the educational status of the owners of the enterprises on the first time calves were given water after birth was determined not to be statistically significant in the current study**.**

According to evaluation concerning weaning age of calves made in the province of Erzincan, 0.6% of the enterprises weaned their calves at one month of age, 10.9% at two months of age, 79.7% at three-four months of ages, 5.4% at five-six months of ages and 3.4% at seven months or more. In other studies investigating the weaning times of calves; Kaygısız et al. (2008) and (Yeşil, 2015) respectively reported that in 56.0% and 61.5% of dairy cattle farms in Kahramanmaraş and Iğdır provinces calves were weaned at 3-4 months of age. Kum (2006) reported that calves in most of the farms (48.82%) located in Antalya province were weaned at the end of the 4th month. On the other hand, milk feeding period in the farms of the Giresun region was around (47.5%) 2 months of age (Tugay and Bakır 2008).

In the present study, the effect of the educational status of the owners of the farms on the weaning age of calves was not statistically significant (Figure 10)**.**

As part of this assessment of the feeding of calves that have an important place in enterprises, it was found out that 98.9% of enterprises fed the calves with colostrum after birth, and 1.1% do not give colostrum to calves. The percentages of the enterprises fed newborn calves for one day, two days, three days of postpartum with colostrum in central county of Erzincan province were determined to be 3.1%, 6.0%, 90.8% respectively.

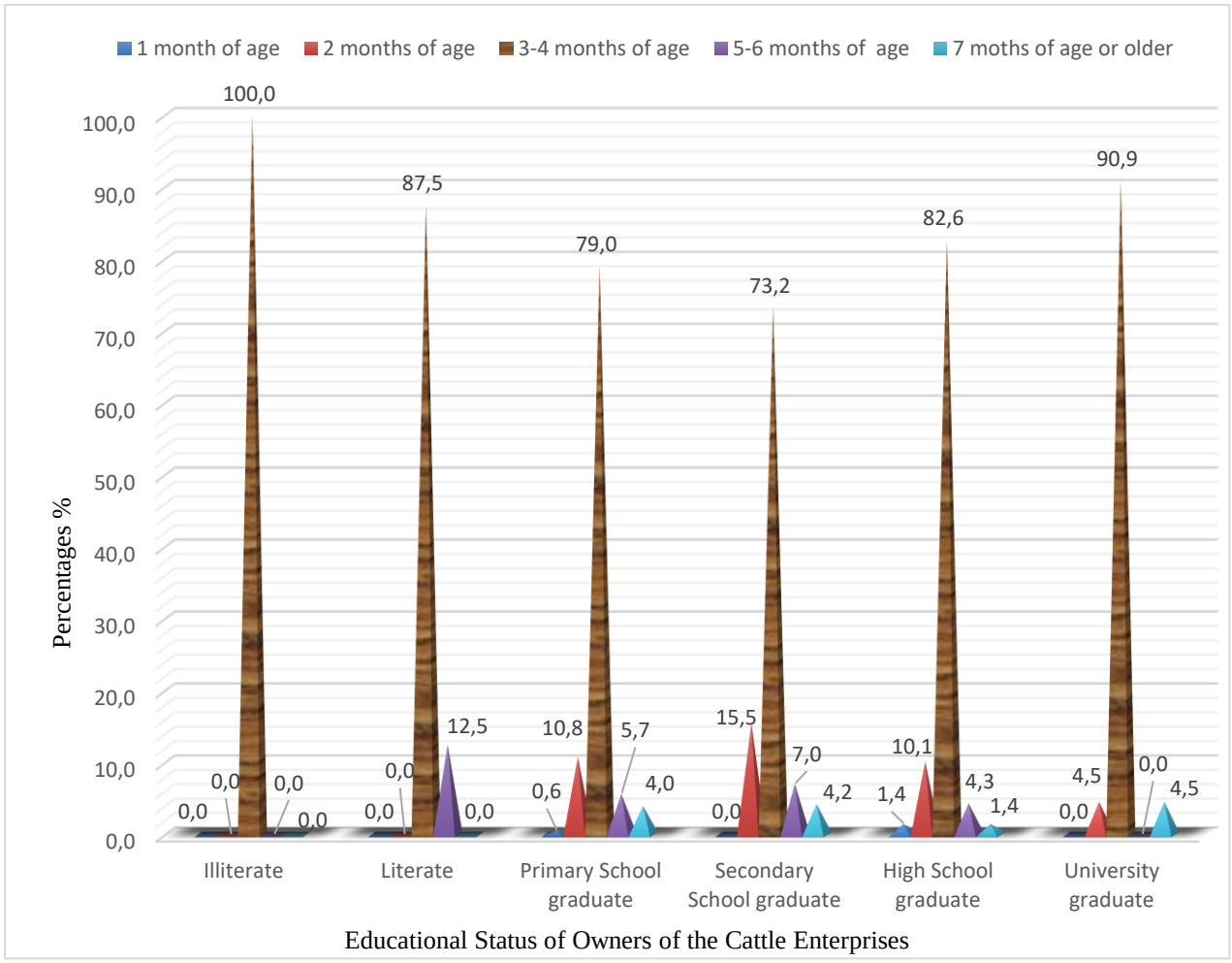

Figure 10: Distribution of weaning ages of calves according to the educational status of the owners of the enterprises.

Şekil 10: İşletme sahiplerinin eğitim durumlarına göre buzağıların sütten kesim yaşlarının işletmelere göre dağılımı

Likewise, Çapadağ (2017) stated that the percentage of farms offered colostrum to calves was 91.3% while 65.7% of these enterprises gave colostrum to calves for three days after birth in the Yakutiye county of Erzurum province. Additionally, Koçyiğit et al. (2016) reported that 75.0% of the farms in Hınıs county offered colostrum to the new-born calves while 68.0% of these enterprises fed the young animals with colostrum for two days. In a study conducted in Konya by Akkuş, (2009), the percentage of enterprises feeding colostrum to newborn calves was 99.5% and the percentages of enterprises feeding colostrum for the first three days in Ankara and Aksaray were 53.3% and 80.4% respectively (Tatar, 2007). In the present study, it was also determined that the effect of the education level of the owners of the enterprises in the central county of Erzincan on the duration of colostrum feeding after birth of the calves was found to be statistically insignificant.

Conclusion and Suggestions

In the central district of Erzincan province, pasture-based cattle breeding is dominant. Moreover, a significant part of the animals are moved to pasture in the early spring period. For this reason, pasture alone is insufficient in terms of feeding of the animals in this period.

Despite this negative fact concerning animal feeding in the central county of Erzincan province, the production of forage crops in 3/4 of the existing enterprises was evaluated as a positive situation. There was an increase in the number of cattle enterprises which produced forage crops as the number of animals raised on farms increases. The size of the enterprise is seemed as the biggest obstacle in front of the breeders in transition to modern animal husbandry. The incentive system applied in animal husbandry should be given to enterprises with at least 30-40 cattle instead of small family enterprises, thus increasing of the size of the enterprises should be encouraged.

On the other hand, the fact that silage production is not at the desired level was considered as an important nutritional problem for dairy cattle breeding in the central county of Erzincan province. In conclusion, the awareness of the owners of the enterprises especially for silage corn planting has to be increased and the incentives and financial supports in this respect should be raised. Both of training courses and projects about animal feeding and preparation of rations for cattle including cows, heifers and calves needs to be developed in order to increase the knowledge, awareness, skills and technical education levels of the cattle breeders. At the same time, agricultural extension service delivery should be boosted more effectively in the rural areas.

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