

# Feed Usage and Feeding Practices in Cattle Farms in İspir County of Erzurum Province

## Erzurum İli İspir İlçesi Sığırcılık İşletmelerinde Yem Kullanımı ve Sığır Besleme Uygulamaları

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### ABSTRACT

The aim of this study was to determine the current situation on feed usage and cattle feeding practices and reveal the concerning problems in cattle enterprises in İspir county of Erzurum Province to suggest solutions for these problems.

For this purpose, a face-to-face survey was conducted with the owners of 394 randomly selected cattle breeders. Data obtained were statistically analyzed using the chi-square independence and frequency analysis test. Results: According to the findings, it was determined that 97.7% of the enterprises made plant production. Silage, which is an important source of roughage, was utilized at a very low level (2.8%) in the county. It was also determined that the breeders generally fed their animals based on their own knowledge and experience. They started offering roughage and concentrate feed to the calves in the fourth week (97.5%) and watering in the third week (98.7%) after birth. It was found that 99.7% of the enterprises initiated pasture grazing in April (95.4%) and animals were grazed in the pasture for more than 5 months.

It was concluded that there is a lack of information about animal feeding among breeders in the county. For this reason, training activities by the relevant institutions, increasing the knowledge and skills of the breeders, and encouraging silage production will benefit the development of the region's livestock production.

**Keywords:** Cattle, feed usage, feeding practices, forage, silage

### ÖZ

Bu çalışmanın amacı, Erzurum ili İspir ilçesindeki sığırcılık işletmelerinde yem kullanımı ve hayvan besleme uygulamalarına ilişkin mevcut durumu belirlemek ve ilgili sorunları ortaya koyarak bu sorunlara çözüm önerileri getirmektir. Metod: Bu amaçla şansa bağlı olarak seçilmiş 394 sığır yetiştiricisiyle yüz yüze anket yapılmıştır. Elde edilen veriler istatistiksel olarak Ki-kare Bağımsızlık testi ve frekans analiz metodu kullanılarak analiz edilmiştir. Elde edilen bulgulara göre yetiştiricilerin %97,7'sinin bitkisel üretim yaptığı saptanmıştır.

Önemli bir kaba yem kaynağı olan silaj ise ilçede çok düşük düzeyde (%2,8) kullanılmaktadır. Yetiştiricilerin yemleme uygulamasını genellikle kendi bilgi ve tecrübelerine göre yaptıkları belirlenmiştir. Yetiştiricilerin buzağılara kaba ve kesif yem vermeye doğumdan sonra dördüncü haftada (%97,5), su vermeye ise üçüncü haftada (%98,7) başladıkları tespit edilmiştir. İşletmelerin %99,7'sinin mera kullandığı, genellikle Nisan ayında (%95,4) meraya çıkıldığı ve 5 aydan daha fazla merada kaldığı belirlenmiştir. Sonuç: İlçede hayvan yemleme ve besleme konularında bilgi eksikliği bulunduğu sonucuna varılmıştır. Bu nedenle ilgili kurumlar tarafından eğitim çalışması yapılması, yetiştiricilerin bilgi ve becerilerinin artırılması ve silaj üretiminin teşvik edilmesi bölge hayvancılığının kalkınmasına fayda sağlayacaktır.

**Anahtar Kelimeler:** Sığır, yem kullanımı, besleme, kaba yem, silaj

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### Introduction

The Eastern Anatolia Region has an important potential in terms of animal production, with its wide and fruitful pastures and plateaus besides quality lands suitable for forage crops cultivation. Although it is the most important region of Turkey in terms of animal husbandry with its potential, it is one of the regions where structural problems are observed the most in animal production.

Livestock production in İspir county of Erzurum province is an important source of livelihood in areas that are unsuitable for growing cultivated plants due to its topographic and climatic conditions. However, this type of animal husbandry is mostly carried out with traditional techniques and is quite simple compared to animal husbandry in developing countries (Akbay & Boz, 2005). Therefore, the only way to survive in today's dairy cattle industry, where competition is severe, is to follow and apply the innovations in the sector. The acceptance and spreading of agricultural innovations are extremely important for the development of agriculture and the society living in rural areas. One of the ways to increase the profit in animal production is to use new technologies that are proved to be effective in reducing the costs of the enterprises. Adoption of new technologies by farmers will help economic profitability in the short-term and improve the living conditions of the society and the sustainability of the sector in the long-term (Boz et al., 2002).

The breeders of the Eastern Anatolia region do not meet the requirements to increase the yield in animal production. In order for the region's enterprise owners to continue their work profitably, it is highly required to give up working with low-yielding breeds that increase the production cost and decrease the quality and to improve the conditions and techniques for livestock production (Koçyiğit et al., 2015).

İspir county is located 143 km north of Erzurum city center and the total area of the county is 22,44 km<sup>2</sup>. There are many large and small mountains at an altitude of between 2400 and 3900 meters within the boundaries of the county. Small and large livestock and plant productions are highly important in the livelihood of the local community (Anonymous, 2021).

According to TÜİK (Turkish Statistical Institute) 2021 first period data, Erzurum province constitutes 5.03% of Turkey's cattle stock with 920,642 animals. With this number, this province is in second place after Konya in terms of cattle population. İspir county constitutes 2.67% of the cattle present in the Erzurum province.

## Methods

The survey study was carried out on the owners of randomly selected dairy cattle enterprises in the İspir county of Erzurum province, and the data obtained from the questionnaire constituted the material of the study. The enterprises were visited and the current situation was tried to be revealed through observation together with survey questions.

Since the variance is unknown as well as the population is limited and there are qualitative variables dependent on probability, the method whose formula is given below was utilized for the determination of the sample size of the research (Arıkan, 2007).

$$n = \frac{N \cdot d^2 \cdot p \cdot q}{(N - 1) \cdot D^2 + d^2 \cdot p \cdot q}$$

In this formula,

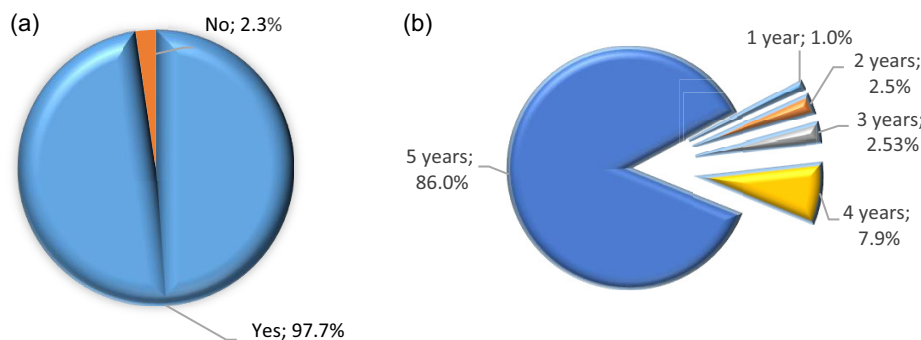
$n$  = minimum number of necessary samples,  $N$  = population size,  $D$  = acceptable or desired sampling error (5%),  $t$  = table value ( $t = 1.96$  for  $\alpha = .05$ ),  $p$  = the rate to be calculated (.5),  $q = 1 - p$ .

$$n = \frac{2107 \cdot (1.96)^2 \cdot 0.5 \cdot (1 - 0.5)}{(2107 - 1) \cdot (0.05)^2 + (1.96)^2 \cdot 0.5 \cdot (1 - 0.5)} = 325$$

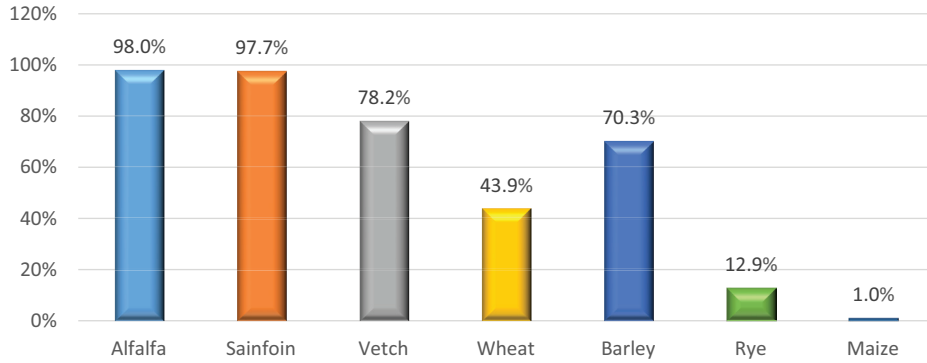
With the formula written above, the estimated sample size was calculated to be approximately 325. According to this result, the number of surveys was increased by 21.23% and the number of surveys to be conducted in the villages of the İspir county of Erzurum province was determined as 394. The data obtained from surveys were transferred to Excel 2010 computer program. The percentage values were obtained by using frequency analysis in descriptive statistical method available in the IBM Statistical Package for the Social Sciences version 20.0. (IBM SPSS Corp., Armonk, NY, ABD). Graphs were produced by using the proportional values and the results were interpreted. The effects of number of animals (0–10, 11–20, 21–30, 31–40, and 41+ head cattle) raised in the enterprises and the educational status of the owners of the enterprises (illiterate, literate, primary school graduate, secondary school graduate, and high school graduate) on the parameters investigated in the current study were analyzed statistically by using the Chi-Square test in the SPSS package program (Yıldız & Bircan, 2006).

## Results

Feed costs constitute the largest share of expenses in dairy cattle farms. For this reason, enterprises are required to make plant and animal production together in order to reduce feed or feeding costs. It was determined that 97.7% of the surveyed enterprises are engaged in plant production in the county (Figure 1a). The majority of these enterprises (86.0%) were determined to have been making crop production for more than 5 years (Figure 1b).



**Figure 1.** (a) Do You Make Plant Production? (b) How Long Have You Been Cultivating Forage Crops?



**Figure 2.** Types of the Roughage and Concentrate Feeds Produced in the Enterprises.

Mostly alfalfa, sainfoin, and vetch were produced as roughage in the enterprises, while barley, wheat, rye, and corn were the most produced as concentrate feed (Figure 2). Corn silage production in the county was at a very low level.

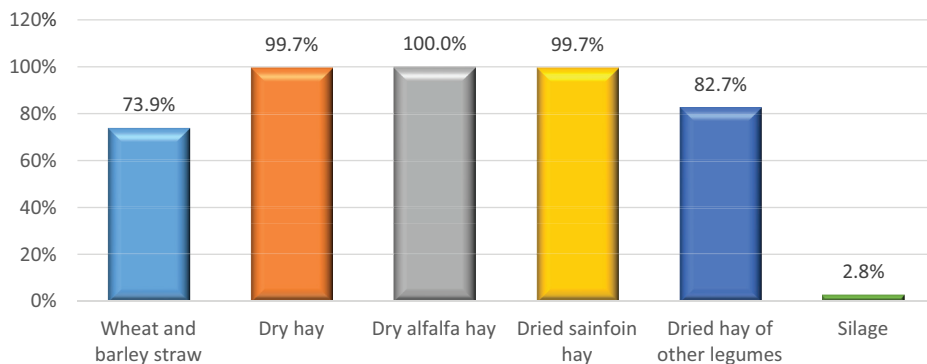
In terms of forage and concentrate feed production, findings related to alfalfa, sainfoin, vetch, barley, and wheat production were similar to other literature findings. However, the data concerning corn production in the county was quite lower than the results of many studies. Sezer et al. (2020) reported that 91.4% of the enterprises in Nevşehir province produced alfalfa, 83.8% corn for silage, 33.3% oats, 36.2% vetch, and 96.2% straw. Similarly, Öztürk et al. (2019) determined that 91.67% and 81.82% of the breeders in Tekirdağ and Kırklareli provinces, respectively, produced forage crops and barley, silage corn, and alfalfa most commonly. Bakır and Kibar (2018) reported that 87.8% of the enterprises in Muş province produced forage crops and the most produced forage crop was alfalfa (33.82%). Vural (2018) reported that enterprises in Kırıkkale mostly produce barley and wheat straw (74.6%), barley (62.3%), and alfalfa (22.0%). Diler et al. (2018) determined the percentages of forage crops cultivated in the cattle enterprises in Narman county as 61.5% alfalfa, 60.1% barley, 45.7% vetch, and 37.5% sainfoin. Hozman (2014) stated that 90.2% of the farms in Sivas have wheat, 62.4% alfalfa, and 48.9% barley production, but vetch and silage corn production is quite low. Demir et al. (2013) stated that 88.7% of the enterprises in Kars Province produce forage crops. On the other hand, in some studies conducted in Turkey, the production rate of forage crops was reported at a lower rate (Akkuş, 2009; Diler et al., 2016; Sürmen et al., 2008; Tugay & Bakır 2008). In the aforementioned

studies, it can be seen that the production of silage corn, which is an important source of forage for dairy cattle, is quite low in the provinces in the Eastern Anatolia Region and higher in other regions.

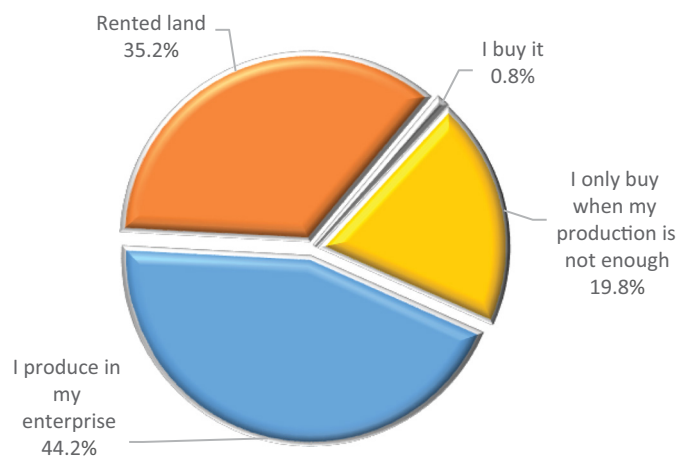
In the multi-select question, it was asked to breeders “Which type of roughage do you use in your enterprise?” and the majority of the enterprise owners stated that they used alfalfa, sainfoin, dry meadow, grass, and vetch. Corn silage usage was found to be very low (Figure 3).

It was determined that the rate of those who buy roughage from outside in the enterprises in İspir county was extremely low (0.8%), while the breeders who make their own production were the majority (Figure 4). Of all the self-producing enterprise owners, 44.2% of them stated that they use their own land for production and 35.0% of them noted that they produce the roughage on rented land. Moreover, 19.8% of these breeders stated that they meet their roughage needs by purchasing when their production is not enough.

Similarly, Diler et al. (2018), Bakır and Kibar (2018), Demir et al. (2013), Bogdanović et al. (2012), and Dou et al. (2001) reported that roughage was mostly produced in the enterprises in Narman county, Muş Province, Kars Province, in Serbia, and the United States, respectively. On the contrary, Sezer et al. (2020), Diler et al. (2016), Daş et al. (2014), Ayman (2014), and Kaygısız and Tümer (2009) reported that the percentages of the enterprises that purchased the roughage instead of producing was considerably high in Nevşehir province (98.1%), Hınıs county of Erzurum province (63.0%), Bingöl province (88.7%), and Kahramanmaraş



**Figure 3.** Types of the Roughage Used in the Cattle Farms (%).



**Figure 4.**  
Sources of Roughage Supply (%).

province (61.0%). Also, Kurt et al. (2020) and Oğuz et al. (2013) reported that in Burdur and Muş Provinces, the percentages of the enterprises who used both methods for roughage supply were 82% and 50.7%, respectively.

In this study, it was found out that in almost all of the surveyed enterprises (99.7%), dry hay was produced (Figure 3). It was also determined that the dry hay produced in the enterprises was mostly used for feeding the animal (97.7%) in their own enterprises, only 2.3% of the enterprise owners stated that they sell their surplus dry hay (Table 1).

The silage usage rate (2.8%) in the farms was determined to be considerably low and enterprises supplied the silage either by own production (0.8%) or by purchasing (2%). The longest silage using enterprise was determined to be feeding their animal with silage for 4 years (Table 1). Similarly, Diler et al. (2016) reported that the use of silage was quite low (0.25%), while Kurt et al. (2020) (18.8%), Aydın and Keskin (2019) (30%), Özyürek et al. (2014) (13%), and Önal and Özder (2008) (96.5%) reported different results in their studies.

| If you produce dry hay, how do you evaluate it?         | Quantity   | Proportion (%) |
|---|------------|----------------|
| I feed my animals                                       | 385        | 97.7           |
| I sell the surplus                                      | 9          | 2.3            |
| <b>Total</b>  | <b>394</b> | <b>100.0</b>   |
| <b>How long have you been using silage as roughage?</b> |            |                |
| I do not use silage                                     | 383        | 97.2           |
| 1–2 years   | 5          | 1.3            |
| 2–4 years   | 6          | 1.5            |
| <b>Total</b>  | <b>394</b> | <b>100.0</b>   |
| <b>How do you supply silage in your enterprise?</b>     |            |                |
| I produce it  | 3          | .8             |
| I buy it  | 8          | 2.0            |
| <b>Total</b>  | <b>11</b>  | <b>2.8</b>     |

The types of concentrate feed used in the enterprises and their percentages are given in Figure 5. The most commonly used concentrate feed sources by breeders were determined to be bran, crushed barley, and fattening feed, respectively. Dairy cattle feed and heifer feed were used at low levels. In addition, 8.4% of the respondents stated that they do not use concentrate feed.

Vural (2018) reported that almost all of the enterprises used commercial factory feed (96.2%), and barley (80.7%) usage was quite high; however, bran (14.6%), vetch (2.3%), and wheat use (10.0%) was considerably low in the enterprises in Kirikkale province. Furthermore, Diler et al. (2018) determined that 34.0%, 23.0%, 22.0%, and 18.0% of the enterprises in Narman county of Erzurum province used crushed barley, fattening feed, dairy cattle feed, and bran, respectively.

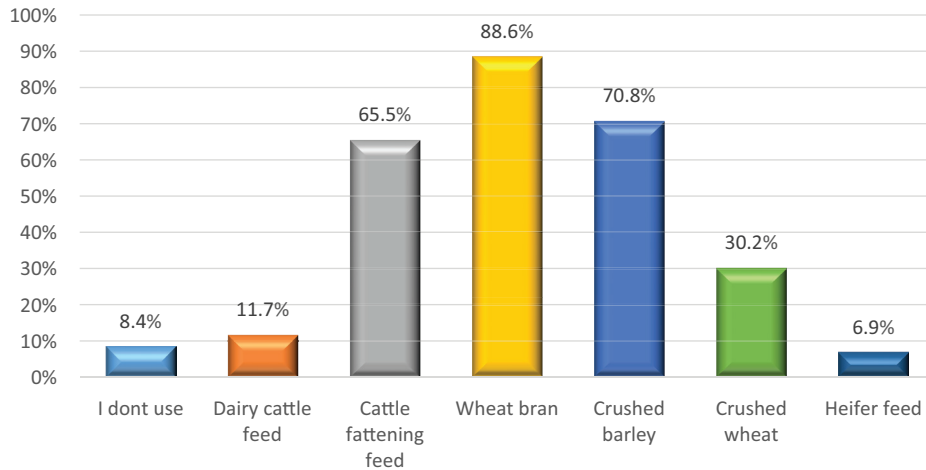
It was asked to breeders, “Where do you supply concentrate feed?” and breeders answered the multi-select question by stating that they either produce their own feed (69.3%) or they supply their needs by purchasing from outside (62.7%) in addition to their production, the (Figure 6). In addition, it was determined that a significant amount of concentrate feed was purchased from the feed factories (31.7%) and the agricultural credit cooperative (22.3%) in the county. The fact that the breeders produce their own feed to a large extent can be considered as an effort to make livestock economically without being dependent. In addition, the high feed prices may also have an impact on this practice.

Similarly, Vural (2018), Bogdanović et al. (2012), Önal and Özder (2008), and Dou et al. (2001) stated that concentrate feed was mostly produced by the enterprises themselves in their studies. On the contrary, Kılıç and Eryılmaz (2020), Bakır and Kibar (2018), Diler et al. (2016), Ayman (2014), Daş et al. (2014), Boz (2013), and Kaygısız and Tümer (2009) noted that concentrate feed was mostly purchased from a feed factory or feed mills. Tugay and Bakır (2008) and Diler et al. (2016) reported the percentages of breeders who prefer feed mills to be 83.4% and 64%, respectively. On the other hand, Kılıç and Eryılmaz (2020) and Soyak et al. (2007) reported that 65.7% and 65% of the enterprises preferred feed dealers, while Demir et al. (2013) stated that agricultural cooperatives were preferred by 42.5% of the enterprises for concentrate feed supply in their study. It is seen in Figure 7a that most of the breeders are satisfied (78.4%) with factory feed. One of the most important reasons for dissatisfaction is thought to be high feed prices.

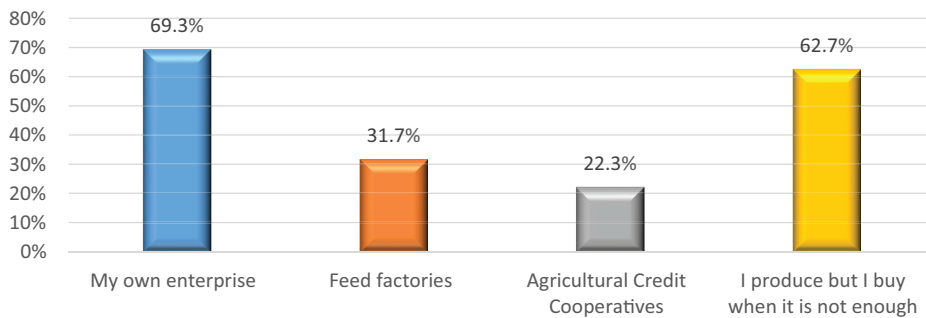
A statistically significant ( $p < .01$ ) relationship was found between satisfaction with factory feed and the education level of the breeders and the size of the farm. Literate and illiterate breeders were less satisfied with factory feed compared to other education groups. While the satisfaction percentage was found between 96.3% and 100% in the enterprises possessing 21–30 heads and above animals, a relatively lower satisfaction level was determined (61.5%–78.3%) in the enterprises having 1–10 and 11–20 heads and below animals.

It was determined that all of the enterprises kept the factory feed, other grain, and concentrate feed in a closed store (100%). Similarly, Vural (2018) reported that 74% of the enterprises stored concentrate feed in a separate feed storehouse.

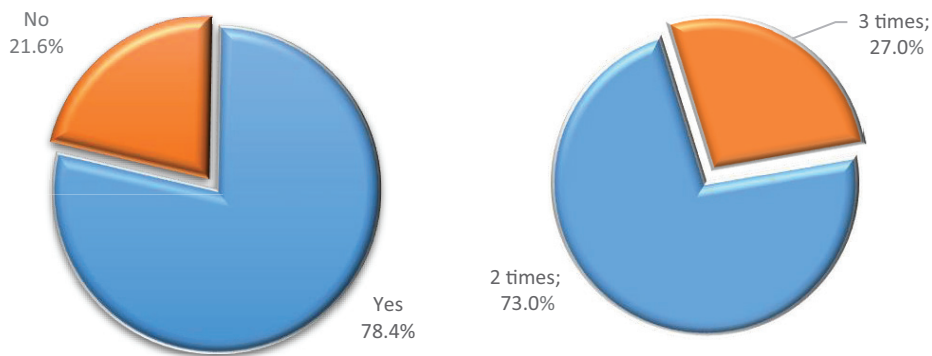
The animals were fed either 2 (73%) or 3 (27.0%) times a day in the enterprises of the county (Figure 7b). Similarly, percentages of the enterprises feeding their animals two times a day were reported



**Figure 5.**  
Types of the Concentrate Feed Used in the Farms (%).



**Figure 6.**  
Sources of the Concentrate Feed Supply (%).



**Figure 7.**  
(a) Are You Satisfied with The Factory Feed? (b) How Many Times a Day Do You Feed Your Cattle?

as 91.5%, 78.1%, and 63.2% by Vural (2018), Sezer et al. (2020), and Önal and Özder (2008), respectively.

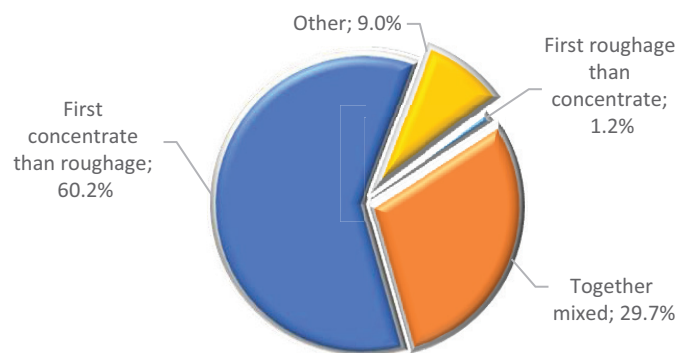
The majority of the enterprise owners stated that they first feed concentrate and then roughage (60.2%), and 29.7% stated that they gave both feeds mixed together (Figure 8). The breeders, constituting 9.0% of the enterprises, stated that they only give roughage or concentrate feed mixed with straw.

Unlike the presented study, Akkuş (2009) determined that 70.5% of the enterprises in Konya gave mixed feed with roughage and concentrate, 22.9% of them gave roughage first and then

concentrate, and 6.5% of them gave concentrate first and then roughage. Sezer et al. (2020) stated that 56.2% of the enterprises gave a mixed feed of roughage and concentrate.

In order to achieve profitability in animal production, breeders are expected to feed the animals consciously. For conscious feeding, it is required to obtain technical information support from qualified persons or relevant institutions. For determining the breeder's information sources and the situation of the enterprises in terms of receiving information support it was asked to the participants "What is your information sources to





**Figure 8.**  
Percentages of the Methods of Feeding Animals.

feed the animals?” and to this multi-select question, 99.0% of the breeders answered that they feed their animals based on their own knowledge and experiences (Figure 9). In addition to their own knowledge about feeding, it was also determined that breeders benefited relatively from veterinary advice (32.7%), feed factory recommendation (14.5%), unions and cooperatives (8.6%), and agricultural engineers (animal scientists) at a very low level (.3%).

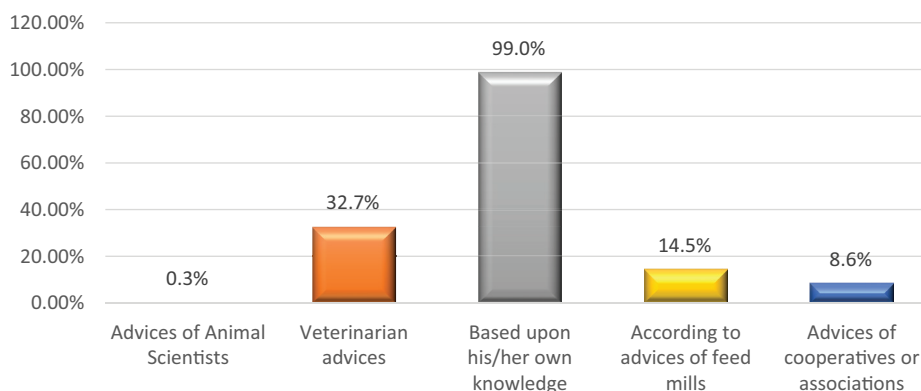
Similarly, Sezer et al. (2020) stated that 62.9% of the breeders practiced animal husbandry according to traditional methods without any training education, and the amount of feed given to animals was determined by rough estimate (42.0%) or based on the experience of the breeders (38.1%). Oğuz et al. (2013) reported that 92.6% of the enterprises in Burdur province determined the

amount of feed given to animals according to their own knowledge, while 5.6% and 2.8% of them determined the feed amount based on the recommendations of the factory where they bought feed and veterinarians, respectively. Vural (2018) stated that 81.5% of the enterprise owners in his study believed that they have sufficient knowledge and experience about animal breeding and 61.5% of these enterprises received information support for animal feeding. It has been reported that 65.7% of the enterprises in Ağrı province did not receive technical information support, and 59.0% of these enterprises continued their breeding with traditional methods (Bakan & Aydın, 2016). Akkuş (2009) found out that 71.7% of the enterprises in Konya province received technical information support.

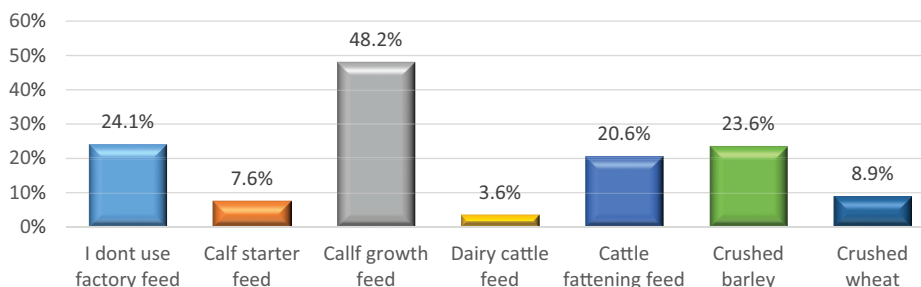
It was also determined that the calves are generally fed by dry hay or straw as a source of roughage and almost half of the enterprises used calf growth feed (48.2%) as a concentrate feed source. In addition, it was determined that the calves were fed by crushed barley, fattening feed, crushed wheat, calf starter, and dairy cattle feed from most to least, respectively. Moreover, 24.1% of the participants stated that they did not use concentrate feed for calf feeding (Figure 10).

Similar to the findings in the study, Sezer et al. (2020) determined that 98.1% of the farms used concentrate feed and 100% use roughage in the feeding of calves in Nevşehir province. On the contrary, Tugay and Bakır (2008), Bayındır (2008), and Diler et al. (2016) reported that 98.9%, 91.3%, and 60% of the enterprises did not offer concentrate feed to the calves.

Information about the period of roughage, concentrate, and water feeding of calves after birth, the dates that the calves were



**Figure 9.**  
Percentages of Sources of Information Concerning Cattle Feeding.



**Figure 10.**  
Types of Feeds Bought from Feed Factories.

**Table 2.**  
*Times to Start Roughage, Concentrate and Water Feeding of Calves and Dates and Duration of Starting Pasture and Plateau Feeding*

| When do you start roughage and concentrate feeding of calves after birth ? | Quantity | Proportion(%) |
|--|----------|---------------|
| 2 weeks  | 1        | .3            |
| 3 weeks  | 2        | .5            |
| 4 weeks  | 384      | 97.5          |
| 5 weeks  | 7        | 1.7           |
| <b>Total</b>   | 394      | 100.0         |
| <b>When do you start rouwatering calves after birth?</b>                   |          |               |
| 2 weeks  | 2        | .5            |
| 3 weeks  | 389      | 98.7          |
| 4 weeks  | 3        | .8            |
| <b>Total</b>   | 394      | 100.0         |
| <b>Do you move your cattle to pasture?</b>                                 |          |               |
| Yes  | 393      | 99.7          |
| No   | 1        | .3            |
| <b>Total</b>   | 394      | 100.0         |
| <b>In which months do you move your cattle to pasture?</b>                 |          |               |
| March  | 14       | 3.6           |
| April  | 375      | 95.4          |
| May  | 4        | 1.0           |
| <b>Total</b>   | 393      | 100.0         |
| <b>How long do you feed your cattle in the pasture?</b>                    |          |               |
| 4 months   | 1        | .3            |
| 5 months   | 1        | .3            |
| More than 5 months   | 391      | 99.5          |
| <b>Total</b>   | 393      | 100.0         |
| <b>Do you move your cattle to plateau?</b>                                 |          |               |
| Yes  | 68       | 17.3          |
| No   | 326      | 82.7          |
| <b>Total</b>   | 394      | 100.0         |
| <b>If yes, in which months do you move your cattle to plateau?</b>         |          |               |
| April  | 44       | 64.7          |
| May  | 12       | 17.6          |
| June   | 11       | 16.2          |
| July   | 1        | 1.5           |
| <b>Total</b>   | 68       | 100.0         |
| <b>How long do you feed your cattle in the plateau?</b>                    |          |               |
| 2 months   | 24       | 35.3          |
| 3 months   | 27       | 39.7          |
| 4 months   | 17       | 25.0          |
| <b>Total</b>   | 68       | 100.0         |

allowed to go pasture and plateau, the time spent there are presented in Table 2.

It was determined that the breeders generally started roughage and concentrate feeding of calves at the fourth week (97.5%), and water feeding at the third week after birth (98.7%). Similarly, Vural (2018) stated that the majority of the enterprises in Kırıkkale Province and Savaş (2016) reported that 51.7% of the enterprises in Rize Province started to offer feed to the calves from the fourth week after birth. On the other hand, Bayındır (2008) stated that 79.2% of the enterprises in Van Province and Akkuş (2009) stated that calves were started to be fed when they were 3 weeks old on average in Konya Province.

Hozman (2014) determined that 98.5% of enterprises in Sivas province started concentrate feeding of calves at 6–7 days of age. Oğuz et al. (2013) stated that in Burdur province, concentrate feed started to be given to calves from the ninth day on average. Diler et al. (2016) reported that breeders generally started to give roughage and concentrate feed to the calves at 4 weeks (52.0%) of age or later (30.0%) and water feeding started at 1–2 weeks (77.0%) of age.

In studies conducted abroad, Vasseur et al. (2010) reported that the average starting age of concentrate feeding for calves was 7 days; dry hay was given at 3 days of age and clean water was given at 2.5 days of age. Heinrichs et al. (1987) stated that concentrate feed (97.9%) was given in the first week, and roughage (78.7%) and water (75.1%) were given in the second week after birth.

Almost all of the surveyed enterprises (99.7%) moved their animals to pasture (Table 2). It was determined that the breeders generally started the pasture feeding in April (95.4%) and grazed their animals in the pasture for more than 5 months (99.5%). Similar to the presented study, Vural (2018) stated that 70% of the enterprises in Kırıkkale region utilized pasture, and the pasture feeding lasted about 6–9 months (57.3%). Akman (2013) determined that pasture feeding lasted for 6–7 months in Sarıkamış county and 100% of the enterprises utilized pasture in the county. Tugay and Bakır (2008) reported that 86.3% of the enterprises in the Giresun province utilized pasture and animals for 5–7 months (63.3%) in the pasture. Pasture utilization rates were reported as 78.4%, 80.0%, and 95.6% in the enterprises in the Black Sea region, Sivas Province, and Van Provinces by Surmen et al. (2008), Hozman (2014), and Bayındır (2008), respectively.

On the other hand, Ayman (2014) stated that 45.7% of the enterprises in Kahramanmaraş Province made pasture feeding and this practice was started mostly in March (43.2%). Ödevci (2016) stated that 50.8% of the enterprises utilized pastures and pasture feeding lasted mostly for 3–5 months (48.5%). Oğuz et al. (2013) reported that 16.0% of the enterprises in Burdur Province used pasture, while Bayındır (2008) reported that the average usage period of pastures in Van Province was 5 months.

Plateaus are important sources for the nutrition and health of animals. Of all the participants, 17.3% of them stated that they have the opportunity to go to the plateau. It has been determined that the date to move animals to the plateau was mostly in April (64.7%), and breeders continued to move animals to the plateau in May (17.6%) and June (16.2%) as well. It was also determined that 35.9% of the enterprises let their animals stay in the plateau for 2 months, 39.7% for 3 months, and 25.0% for 4 months (Table 2).

In other studies, the opportunity of going to the plateau and the duration of stay were 33.2% and generally 3–4 months in Giresun region (Tugay & Bakır, 2008), 8.0% and mostly 3–5 months in Kahramanmaraş Province (Kaygısız & Tümer, 2009), respectively. In Hınıs county, it was reported as 20.0% and generally 2–3 months (Diler et al., 2016).

As a result, it can be deduced that feeding practices in İspir county of Erzurum province are fairly well. It was determined that the enterprises could produce their own roughage and concentrate feeds and were satisfied with the purchased factory feeds. The applications made in terms of the dates of feeding animals in the pasture and the duration of their stay in the pasture were evaluated positively. In addition, it was concluded that the time to start roughage and concentrate feeding of calves was also appropriate.

However, April is early for county's enterprises to start pasture feeding. For pastures to stay in proper form and to be used for a longer period of time, breeders are recommended to move their animals to pasture in May. In addition, it was determined that the enterprises used fattening feed, bran, and crushed barley at a higher rate, and dairy cattle feed and corn silage at a lower rate. The majority of the farm owners feed the animals based on their own knowledge, and they are insufficient in terms of obtaining and applying technical information in their farms. The calves should be given starter feed first, but calf growth feed usage was more common among breeders. A significant proportion of the breeders did not give concentrate feed to the calves; this application was interpreted as an important deficiency, and awareness of the farm owners should be increased about calf feeding.

It is seen that the breeders in İspir county have a lack of knowledge about animal feeding and feed usage. To eliminate these deficiencies farm owners should be trained and information support should be provided by training studies by the relevant institutions in the region.

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