

RATION COMPOSITION AND FORMULATION OF WINTER AND SUMMER RATIONS FOR DAIRY COWS

Eshmuratova Suluxan Tulegenovna

Candidate of Agricultural Sciences (PhD), Associate Professor

Karakalpakstan Institute of Agriculture and Agrotechnologies

E-mail: sulukhaneshmuratova@gmail.com

Utemisova Aygul Kiyas kizi

Master's Degree in Selection and Breeding of Agricultural Animals

Karakalpakstan Institute of Agriculture and Agrotechnologies

E-mail: aykoutemisova@gmail.com

Abstract

This article presents information on feeding dairy cows with supplementary feeds and nutritionally enhanced rations, proper housing and care of cows (loose housing), and the resulting milk productivity and daily milk yield based on planned rations. It also provides information on the formulation of winter and summer rations for dairy cows.

Keywords: Dairy cows, types of feed, feeding, winter ration, summer ration, feed unit, dry matter, protein, energy, minerals.

Introduction. The organization of appropriate feeding of productive cattle should be based on their requirements for energy and biologically active nutrients necessary for milk production, reproduction, and the maintenance of normal functions and health. The nutritional requirements of cows vary depending on their productivity level, physiological condition, age, and other factors.

High productivity depends not only on genetic potential but also on the animal's age, live weight, physiological condition, level of milk production, housing conditions, and feeding system.

Main part. Along with genetic potential in milk productivity, the energy and protein supply of the ration, feed quality, mineral-vitamin balance, sufficient water, microclimate, and health status are important. At the beginning of lactation, energy requirements increase sharply. Therefore, the ration should be balanced not simply by increasing concentrates, but by properly ensuring the proportion of roughage, succulent, and concentrated feeds.

Silage, haylage, and root crops belong to the group of succulent feeds. These feeds contain a large amount of water, accounting for 70–95%. Their overall nutritional value is not high. Most succulent feeds contain small amounts of protein and minerals. Succulent feeds are useful for dairy cows because they increase milk production. Root crops, fruits of cucurbit crops, and some industrial by-products (wheat, beet, turnip, potato peelings) are also included among succulent feeds.

Stalks of sunflower grown for grain can be ensiled after the grain has been harvested. At the time of grain harvesting, the stalks contain about 50% moisture. In this case, if water is added to the ensiled mass at a rate of 20–25% of its total weight, the moisture content of the stalk mass increases by an average of 5–6%. Increased moisture creates favorable conditions for

proper fermentation in the compacted stalk mass and makes it possible to obtain silage of acceptable quality, although not of the highest grade.

Silage prepared from sunflower stalks is considered a succulent feed for all types of livestock. In terms of feed value, such silage is not inferior to corn-stalk silage. On average, 100 kg contains 16 feed units and 1.5 kg of digestible protein. Silage can also be prepared from plant parts such as beet leaves, potato vines, and cabbage leaves. Each has its own nutritional value. Silage made from 100 kg of beet leaves contains 12 feed units and 2.1 kg of digestible protein; potato-vine silage contains 13 feed units and 2 kg of digestible protein; cabbage-leaf silage contains 12 feed units and 1.4 kg of digestible protein.

Beet leaves may be fed fresh to livestock. However, when given fresh, the leaves can cause diarrhea and may adversely affect the animal's health. Therefore, if beet leaves are fed fresh, coarse roughage and bran should also be added to the ration.

In feeding dairy cows under the climatic conditions of the Republic of Karakalpakstan, greater use is made of roughages (grasses) and of succulent feeds, namely silage and haylage, rich in protein, carbohydrates, mineral salts, vitamins, macro- and microelements, stimulants, and physiologically active substances. Under the sharply continental climate of the Republic of Karakalpakstan, feeding dairy cows is a major issue. When the necessary elements are included in a balanced ration, it becomes possible to obtain the planned level of production.

First, the cow's live weight, milk yield, stage of lactation, and pregnancy status are determined. Then the amounts of dry matter, metabolizable energy, crude protein, calcium, phosphorus, and salt in the ration are assessed.

When evaluating feed intake, dry matter is more important than the as-fed (fresh) weight of the feed. Because silage and green mass contain a high amount of water, equal kilograms of different feeds provide different amounts of nutrients. Energy and nitrogenous substances are jointly necessary for milk production. Energy deficiency may negatively affect milk productivity and reproductive performance, while protein deficiency may adversely affect protein synthesis.

Summer feeding. Under the hot summer conditions of the Republic of Karakalpakstan, heat stress may reduce feed intake. Constant provision of clean, cool water, shifting feeding to relatively cooler times of the day, creating shaded and well-ventilated areas, and using high-quality silage, haylage, and hay are important.

The summer feeding ration for dairy cows on the farm was formulated as follows.

Table 1

Summer feeding ration for dairy cows

No.	Feed type	Amount	Feed units	Digestible protein	Calcium	Phosphorus	Carotene
	Unit of measurement	kg	kg	g	g	g	mg
1	Green alfalfa	40.0	6.8	1600	188	28	568
2	Wheat straw	10.0	2.0	180	56	16	-
3	Wheat stillage	10.0	0.6	230	26.3	4.8	-
4	Cottonseed meal	2.0	2.3	662	5.6	3.2	-
5	Wheat bran	1.0	0.71	126	1.8	10.1	4
6	Table salt	0.50	-	-	-	-	-

	Total	63.5	12.41	2798	278	62.1	572
--	-------	------	-------	------	-----	------	-----

The data in the table above show that the total daily feed consumption for dairy cows is 63.5 kg (including 0.5 kg of table salt), of which roughage accounts for 16%, succulent feed for 79%, and concentrated feed for 5%. The total nutritional value of the ration is 12.41 feed units. When 40.0 kg of green alfalfa was provided, its nutritional value was 6.8 feed units. When wheat straw was mixed with wheat stillage and the amount was 20.0 kg, its nutritional value was 2.6 feed units. During summer, the farm also used concentrated feeds: cottonseed meal (2 kg, nutritional value 2.3 feed units) and wheat bran (1.0 kg, nutritional value 0.71 feed units). The ration contained 2,798 g of digestible protein, 278 g of calcium, 62.1 g of phosphorus, and 572 mg of carotene.

Winter feeding. In winter, the ration may consist mainly of high-quality hay, silage, and haylage. Concentrate feeds are rationed according to milk productivity. Feed should not be changed abruptly, and transition to a new ration should be carried out gradually. Mineral supplements and table salt are provided according to the animal's requirements.

The winter feeding rations for dairy cows on the farm were formulated as follows.

Table 2
Winter feeding ration for dairy cows

No.	Feed type	Amount	Feed units	Digestible protein	Calcium	Phosphorus	Carotene
	Unit of measurement	kg	kg	g	g	g	mg
1	Alfalfa hay	1.0	0.44	101	14	2.1	20
2	Wheat straw	10.0	2.0	180	56	16	-
3	Corn silage	15.0	3.15	180	22.5	7.5	210
4	Alfalfa haylage	8.0	2.8	464	69	8.0	168
5	Fodder beet	6.0	0.84	60	2.4	3.0	-
6	Wheat stillage	10.0	0.6	230	26.3	4.8	-
7	Cottonseed meal	2.0	2.3	662	5.6	3.2	-
8	Wheat bran	1.0	0.71	126	1.8	10.1	4
9	Table salt	0.50	-	-	-	-	-
	Total	53.5	12.84	2003	198	55	402

The data in this table show that the total daily feed consumption for dairy cows is 53.5 kg (including 0.5 kg of table salt), of which roughage accounts for 21%, succulent feed for 73%, and concentrated feed for 6%. The total nutritional value of the ration is 12.84 feed units. When 1 kg of alfalfa hay was provided, its nutritional value was 0.44 feed units. When wheat straw was mixed with wheat stillage and the amount was 20.0 kg, its nutritional value was 2.6 feed units.

Cattle receive 15.0 kg of corn silage, 8.0 kg of alfalfa haylage, and 6.0 kg of fodder beet, with nutritional values of 3.15, 2.8, and 0.84 feed units, respectively. The farm used concentrated feeds in cattle feeding: cottonseed meal (2.0 kg, nutritional value 2.3 feed units) and wheat bran (1.0 kg, nutritional value 0.71 feed units). The ration contained 2,003 g of digestible protein, 198 g of calcium, 55 g of phosphorus, and 402 mg of carotene.

Mineral substances and water. Water is considered one of the most important feed factors for dairy cows. The requirement for water increases especially in hot climates. Water containers must be kept clean, and animals must have free access to water. Calcium, phosphorus, table salt, and trace elements should be monitored. The exact dose of mineral supplements is determined according to the product brand and ration analysis.

Conclusion. Feeding dairy cows with additional feeds on the basis of nutritionally enhanced rations, proper housing and care of cows (loose housing), and feeding according to planned rations result in higher milk productivity and daily milk yield compared with simpler feeding methods.

To effectively use the high milk-production potential of dairy cows under the conditions of the Republic of Karakalpakstan, the feeding system should be adapted to the animal's age, live weight, stage of lactation, and milk productivity. In summer, reducing heat stress, ensuring continuous access to water, and using high-quality feeds are important. In winter, high-quality hay, silage, and haylage should be combined with balanced concentrates. The presented rations are examples and should be determined under farm conditions based on feed analysis and the individual characteristics of the animals.

References

1. Nosirov U.N. Qoramolchilik [Cattle Breeding]. Textbook (in Uzbek). Tashkent: "O'zbekiston milliy ensiklopediyasi" State Scientific Publishing House, 2001.
2. Vladimirov N.I., Cheremnyakova L.N., Lunisin V.G., Kosarev A.P., Popelyaev A.S. Kormlenie selskokhozyaystvennykh zhivotnykh [Feeding of Agricultural Animals]. Study guide (in Russian). Barnaul: Altai State Agrarian University Publishing House, 2008.
3. Hamroqulov R. Qishloq xo'jalik hayvonlarini ozuqlantirish [Feeding of Agricultural Animals]. Textbook (in Uzbek). Tashkent, 2011.
4. Turganbaev R.U., Tleumuratov A.K. Qaramalshılıq [Cattle Breeding]. Textbook (in Karakalpak). Nukus, 2023.