

# Housing and Feeding Holstein Genotypic Yearling and Heifer

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**Abstract:** *The article reveals the results of experiments conducted on raising yearlings and heifers with fodder feeds and nutrients produced on the farm according to feeding norm requirements by age and live weight of yearlings and heifers. As well as, the study analyses have been presented here on feeding cattle by considering feed unit, dry matter, metabolic energy, digestible protein, cellulose, sugar, calcium, phosphorus, carotene in the diet, and on rearing of Holstein genotypic yearlings, the nutrition during their 12<sup>th</sup>-18<sup>th</sup> months, their growth and development.*

**Keywords:** farm, yearling, heifer, cow, milk, rearing, feeding, live weight, feed rate, cellulose, carotene

## 1. Introduction

The intensive development of animal husbandry in our republic has already launched. Successful implementation of this crucial task that was set for livestock breeders in the republic, requires to increase dramatically fodder production, ensure adequate nutrition for all livestock, improve heredity possibilities of cattle through the use of modern achievements in genetics and selection, and ameliorating breeding work, fostering deeply the rearing conditions for young cattle which are intended for refilling the herd, implementing scientific and technical progress into the animal husbandry field and managing it by industrial-based aspect and finally upgrading livestock personnel of all categories.

Further and rapid development of animal husbandry sector is of great importance for providing the people with cheap and best quality meat products and other food products, besides this, employing rural people and increasing their profits.

In accordance with the decree of Shavkat Miromovich Mirziyoyev, the President of the Republic of Uzbekistan, numbered with PD-4947, dated February 7, 2017, the prior tasks have been fixed, such as ‘modernization and intensive development of agriculture’ mentioned in 3.3 item of “Actions strategy on five priority areas of further development of the Republic of Uzbekistan during 2017-2021”, continuous development of agricultural production, further security of the food in the country, increasing the production of ecologically pure products, achieving to high export potential of agrarian sector, developing research works on the creation of high productive animal breeds and implementing them into practice [6].

With the purpose of comprehensive support of entrepreneurial initiatives on the development of animal husbandry, wide introduction of scientific approaches and advanced innovative technologies, further stimulation of production and processing of import-substituting and export-oriented livestock products, and in the consequence of these, to increase living standards of people and their income, Presidential Decree No. PD-4243 dated March 18, 2019 “On measures for further development and support of the livestock industry” has been adopted [3].

It is obvious that cattlebreeding is one of the main and leading sectors of the livestock industry of the country, thus the development of this sector is important to meet the population's needs for milk and meat products.

Moreover, in order to increase the productivity of livestock, it is important to focus on improving the breeding of cattle by studying foreign experience and introducing it to the Republic, especially, creating modern livestock breeding complexes in the regions and also developing bringing of high-quality cattle from abroad that are adaptable to our conditions.

Rapid changing and continuous boiling hot temperature of Uzbekistan makes the cross-breeding of cattle difficult that are brought from abroad, and also causes a favorable condition for the mites which can infect the animals with various parasitic diseases in pasture and barn conditions. Animals are strongly affected by moderate hot and cold climatic conditions. Therefore, it is difficult for livestock to adapt to the conditions of other climatic zones or to climates that are very different from the climatic conditions of this species. Besides adapting the animals to the climatic conditions of new habitat, the conditions for feeding and preserving, the relief of the land, the ratio of water and land, soil properties, the presence of trees and other factors are very important for their survival. The study of above-mentioned factors by scientific point of view is of vital significance for successful mating and crossing of hereditary cattle brought from abroad and obtaining more generation from them, and the introduction of modern methods of their housing, storage, raising and feeding technology to fully demonstrate their genetic potential.

Prevention of dying of young cattle, implementation of automated system of microclimate conditions in the barns and cattle sheds, artificial heating some body parts of young cattle with electricity when necessary and performing stratified system of radiation, as well as using automated devices for raising young cattle are considered the most crucial tasks in livestock breeding [5].

The improvement in the productivity of livestock can be achieved by feeding them rationally and ameliorating their housing facility conditions, and also fostering deeply

breeding work.

Furthermore, in order to achieve high productivity in the field, raising the yearlings for refilling the herd depends on many factors.

The study of these factors, organization of raising of the yearlings by considering aforementioned factors are of scientific-practical importance in increasing the rate of creation of high productive herds and in the improvement of breeds [4].

The main task in young cattle breeding – is a raising of young cattle that follows a production of high quality product and a birth of yearlings per head when they become cows.

It is known that newly born yearlings may be affected by different diseases (especially stomach), even they may die within the first 10-15 days.

The reason of this, is a wrong feeding and housing. Besides, improper housing methods for pregnant cows and heifers, wrong nascence process and feeding and keeping abnormalities of newly born calves in their first day are also another reasons that are to be considered [1].

Complex factors for obtaining healthy calves and heifers are proper preparation of cow and bull for mating in order to prevent them from any diseases, proper preparation of pregnant cows and heifers for nascence, and achieving a right birth, keeping and raising newly- born calf properly [5].

As the scientists state, when the bull is mated with a cow at the first time (less than 50%) and the cow gets inseminated, this bull is not used again for breeding work. Besides it, a facility for birth giving is of particular importance. If the place is small for nascence and there is no smooth and hard cover on the land or other deficiencies exist, then the cows may have stress resulting in difficult birth and also if the newly-born calves are not fed on colostrum (time, amount and how often) according to their physiological needs, then they may face (stomach) different diseases. Thus, in our experiments the newly-born calves were cared in time and fed three times a day.

Particularly, in some cattle farms small sized cows with less milk productivity are being raised due to noncompliance to the requirements of raising of yearlings, heifers for refilling the herds (average daily growth of 300-400 g), untimely mating of yearlings and unpreparedness of heifers for giving births [1, 2].

## 2. Materials and Methods

The research experiments were conducted in “Rokhatoy” farm in Zangiota district of Tashkent region in the order of analogues with 3 groups of 12th months old yearlings, they were separated by 10 heads and observed raising technology by their 18<sup>th</sup> month.

I group – motley yearlings of Uzbekistan.

II group -1/2 motley and 1/2 Holstein yearlings.

III group – Holstein yearlings.

Yearlings of all groups were provided with the same housing and feeding conditions. They were kept in terraced places in groups, where each head could have 4 m<sup>2</sup> area.

## 3. Results and Discussion

Feeding of experimental cattle was performed according to the norms of feed needed for yearlings and calves by their age and live weight on the base of massive and fodder feed produced on the farm.

The yearling were kept under open air terraces at their 6-12<sup>th</sup> and 12-18<sup>th</sup> months in groups. The area of 6m<sup>2</sup> was provided for each head at their 6-12<sup>th</sup> months while in 12-18<sup>th</sup> months this area constituted 8 m<sup>2</sup> and later 10 m<sup>2</sup> area was provided. The terrace had a hard floor and mangers were located in front part of the area. Feeding is performed in these mangers while watering process was carried out in water mangers. There was possibility for cattle to enter the free-range barns in cold days of winter.

The terrace ground was covered with thick layer and dry maure, on which animal felt comfortable. The manure is cleaned from terraced area twice a year while from free zone once a year. The feed was given to the groups, and the amount of actually spent feed was determined by considering the leavings as well.

In cattle housing all zoo-hygienic requirements were followed. The temperature lower than the norm in winter under the terrace didn't influence highly on clinic parameters and physiological processes of animals, on the contrary, housing the animal in this kind of condition affected positively to the formation of exterior and constitution type.

**Table 1:** Microclimatic indexes in animal raising area

Indexes	Measuring unit	Seasons			
		Spring	Summer	Autumn	Winter
Temperature	°C	-2-(30,0)	17,0-40,5	11,5-28,5	-19,0-(5,0)
		16,8	28,9	18,6	0,1
Relative humidity	%	<u>58-90</u>	<u>29-58</u>	<u>45-80</u>	<u>61-90</u>
		74,0	44,5	65,2	78,5
Speed of air movement	m/sec	<u>0,85-7,5</u>	<u>0,6-8,0</u>	<u>0,55-8,7</u>	<u>1,1-9,2</u>
		4,8	3,45	4,3	5,2

In nominator – fluctuation in indexes; in denominator – an average indexes (Table 1).

Microclimatic indexes in free zone varied considerably by seasons. In summer the temperature was 40,50C in the zones while in winter it fluctuated to -19 0C degree, therefore in these too cold days the cattle was allowed to be inside the barn, but this case didn't last long, when there were favorable time in these days yearlings spent some time in free zones.

High relative humidity was observed in early spring (74,0%) and in winter in result of raining and snowing.

Air movement increased after temperature decreased, under the terrace it had lower indexes and at the same time the

cattle was kept under terrace.

**Feeding of yearlings.** The type and norm of feeding play an important role in the formation of productivity parameters of

yearlings and calves. The feed should coincide with physiological process of feed digestion and absorption of yearlings and heifers, also should be cheap and produced in this farm if possible.

**Table 2:** Winter diet of 12-15 months old yearlings

Feed	Amount, kg	Feed unit	Dry matter, kg	Metabolic energy, MJ	Digestive protein, g	cellulose, g	Sugar, g	Calcium, g	Phosphorus, g	Carotene, mg
Hay	2,5	1,1	2,1	16,1	140	642,5	25	20,7	5,0	37,5
Haylage	4	1.4	1,7	14.0	190	631.6	76	40	5.2	20
Silage	10	2	3.2	28	142	1100	60	14	4	120
Straw	1	0.22	0.9	5.4	12	378	60	5.3	1.2	-
Mixed fodder	1	0.96	0.9	10.6	115.4	78.2	56	5.3	8.7	-
Salt	40									
Total:	x	5.68	8.8	47.1	599.4	2830	277	85.3	24.1	177.5

The feeding diet should be according to age of these young yearlings by its content and type, while the amount of feed is a factor for their stomach-intestinal system development (Table-2).

The coincidence of 1.55 kg of dry matter with one feed unit of diet is a traditional norm for winter diet and is suitable for the development of stomach-intestinal system of animals. While metabolic energy is considered sufficient power for intensive development of yearling organism, it is free from digestive protein.

1 feed unit contains 105.53 of digestive protein which is considered norm for the growth of organism.

1 feed unit contains 498,24 g cellulose which is considered suitable for ruminant animals.

Sugar:protein ration in the diet makes 0,5:1 and is sufficient for young cattle.

Calcium and phosphorus that can influence on the growth of young cattle, are of proper amount with the ratio of 0.3:1.

The amount of carotene is also sufficient in the diet for providing organism with enough vitamin A, and can positively influence on physiological process that occur in yearling's organism.

The yearlings of the 16-18th months were fed on intercrops produced in the farm, such as cereals (oats, rye, triticale) grass and green clover, and when their ratio in the diet made 84% by nutritiveness, then it was considered a norm (Table 3).

Dry matter in the content of diet was intended to make the stomach of yearlings work properly and completely, while metabolic energy provided the organism with power and with intensive growth.

A bit more amount of raw and digestive protein than in norm in the diet has become a conventional feeding in our republic in summer as a result of feeding the cattle only on green feed.

The organism was supplied with enough starch, sugar and crude fat. Only a bit lower amount of cellulose than the norm means complete rough stalks of green grass with poor cellulose. After bridging time, organism of yearlings could easily adapt to this diet and digested well the nutrients of feed.

A bit more amount of calcium and phosphorus than the norm provides a good growth of young organism and forms reserve of these minerals.

The diet was enriched with microelements, and more amount of carotene and vitamins coincided with green diet.

Feed combination in winter and summer diets was in norm, and fully satisfied the needs of cattle. By nutritiveness fodder made 18.8% and massive feed made 81.2% of total feed usage that positively influenced on stomach-intestinal activity of the animal, and provided easy digestion. In the content of 1 feed unit of total feed consumption the digestible protein constituted 105,74 g which was considered according to a norm (Table 4).

**Table 3:** Summer diet of 16-18 months old yearlings

№	Feed	Measuring unit	amount	
			at rates	Total in content
1	Green clover	kg	5	
2	Green grain crops	kg	22	
3	Mixed fodder	kg	1.2	
4	Salt	g	42	
5	Ammophos	g	55	
6	In the content of the feed:			
7	Feed unit	kg	6	6.2
8	Metabolic energy	MJ	70	71
9	Dry matter	kg	8.2	7.9
10	Raw protein	g	890	1096,8
11	Digestive protein	g	561	794.1
12	Raw cellulose	g	2337	585.6
13	Starch	g	600	670
14	Sugar	g	430	884
15	Crude fat	g	185	240.6
16	Salt	g	40	42
17	Calcium	g	40	66.5
18	Phosphorus	g	28	104.5
19	Sulfur	g	22	18.2
20	Iron	Mg	440	328.4
21	Copper	Mg	75	43.8
22	Zinc	Mg	300	208.7
23	Cobalt	Mg	6.0	6.26
24	Manganese	Mg	375	2.6
25	Iodine	Mg	3	0.76
26	Carotene	Mg	150	770
27	Vitamin D (calciferol)	Thousand KHB	3.6	100.5
28	Vitamin E (antisterility factor)	Mg	260	1061

**Table 4:** Feed consumption during 12-18 months, kg

№	Feed	Group		
		I	II	III
1	Hay	186	188	189
2	Haylage	351	353	356
3	Silage	779	781	789
4	Straw	80	82	84
5	Green clover	437	441	445
6	Green grain crops	1922	1933	1945
7	Mixed fodder	198	198	198
8	Feed unit	1011	1014,5	1017,5
9	Digestive protein	106,9	107,31	107,72

#### 4. Conclusions

Chinese Holstein breed yearlings consumed the least feed unit for gaining 1 kg weight and showed high hereditary parameters.

Holstein breed yearlings privileged all the time by their live weight which showed higher results by 5 and 2 % than motley breed. Thus, their average daily weight gaining was high too.

Feed combination was in the norm in summer and winter diets that could fully satisfy the cattle need. Fodder made 18.8% by nutritiveness and massive feed made 81.2% of total feed consumption that could positively influence on animal activity and provided well the growth and development of animals.

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