Raising calves using cold methods at an early age

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Abstract. The article discusses the results of scientific and economic experience carried out in the winter - in the spring period, which showed that when raising newborns and calves in dispensary houses in the open air, it is necessary to strictly comply with a number of favorable conditions; calving of cows should take place in stalls: newborn calves in must be kept in a place with their mothers for 24 hours; Calves should be provided with more careful care and their own - temporary feeding, daily addition of dry straw bedding. Young animals raised in the open air, subject to all these specified conditions, are significantly less susceptible to gastrointestinal diseases, grow better and use high-quality roughage more.

1 Introduction

One of the priority tasks of the agro-industrial complex In Uzbekistan, there is a solution to the problem of increasing food resources, providing the population with meat and dairy products according to scientifically based nutritional standards. Consumption of food of animal origin is one of the main indicators of the quality of life of the population. Sustainable provision of food to the population is one of the most important conditions for the stability of the state. The country's provision itself is determined by the level of satisfaction of the population's food needs through its own production. Currently, Uzbekistan is not fully self-sufficient in livestock products.

The general situation in livestock farming has recently undergone significant changes. A major role in these changes was played by the implementation of "Development of the Agro-Industrial Complex" and the adopted Resolution of the President of the Republic of Uzbekistan "On approval of the program for the development of livestock farming and its industries in the Republic of Uzbekistan for 2022 – 2026" (PQ – No. 121 02/08/2022) In order to ensure food supply security through increasing the production of livestock products, the widespread introduction of modern production methods and the creation of an added value chain on this basis, the development of cooperative relations, state support for the

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livestock sector and its industries, and such organizations for the effective use of the achievements of modern information and communication technologies and science in this area: As a result of reforms in this industry in recent years, the supply of livestock products to the population has significantly improved. For example, meat production per capita per month increased by 2.2 times, and milk production by 2.3 times. At the same time, the population of Uzbekistan increased by more than 1.4 times.

In Uzbekistan, most of the livestock is kept in households - 76% cattle, 78% goats and sheep, 53% poultry. They account for 93% of milk, 88% of meat and 62% of eggs supplied in the Republic.

As of January 1, 2023, the total number of cattle reached 13,857.6 thousand heads, and sheep and goats - 23,623.7 thousand heads.

Compared to the corresponding period in 2021, the number of cattle in all categories of farms increased by 2.3%, and sheep and goats by 2.8%.

One of the fundamental factors for increasing the production of livestock products is the organization of proper intensive rearing of replacement young stock; the system for rearing young stock should ensure a more complete realization of the hereditary inclinations of animals in the process of their growth and development, which are secretly interconnected. Their ratio determines the type of animal, which in turn depends on the conditions of its individual development [1,2,3,4].

Unpleasant conditions of rooting and maintenance during the period of growth and formation of organs and the body system have a negative impact on the entire subsequent life of the animal. Therefore, sufficient and adequate feeding and good living conditions for young animals are one of the main factors in increasing the profitability of livestock farming.

The measures taken to accelerate the development of livestock farming made it possible to stop the process of destabilization of domestic livestock breeding and create conditions for its growth. However, based on the current industry development trend, we can conclude that production growth lags behind the demand for milk and beef. The goal set in the “Food Security” doctrine of ensuring up to 90% of milk consumption and 85% of meat consumption through domestic production is a complex problem and requires solving a number of problems, including zootechnical ones.

In solving these problems, one of the most important places is occupied by the rearing of replacement young stock. Raising replacement heifers on a farm should be organized in such a way as to preserve their livestock as much as possible, which should be strong and healthy.

- Increasing cow productivity;
- increase in the number of cattle.

In recent years, many farms and peasant households have been raising calves from the second day after birth in individual houses, dispensaries, and in sheltered facilities in the open air. The introduction of this method can significantly reduce the incidence and mortality of calves at an early age. According to many researchers, year-round rearing of young animals in the fresh air promotes better growth and development, reduction gastrointestinal and respiratory diseases in comparison with analogues contained in premises [1,2,3,4].

However, issues related to the growth and development of calves kept outdoors in the cold season of the year, the cost of feed for their rearing in the conditions of Uzbekistan have not yet been sufficiently studied.

2 Materials and methods

We set the task to study the influence of various methods of raising newborn calves on productivity indicators, morbidity, and the level of animal feed consumption. The studies were carried out on farms in the winter and spring periods of the year. For the experiment,

four groups of calves of the black and white breed, 10 heads each, were approved. The date of birth of calves of the I - experimental and I control groups was brought to the beginning - mid-January, II - experimental and II control - at the end of February - mid-March. The young animals of the two experimental groups were raised in houses. The differences in the technology of raising calves of the I and II experimental groups were as follows: the calving of the cows from which the heifers of the I experimental group were obtained was carried out in stalls, and the calves were in a place with their mothers for 48 hours, and the cows from which the heifers were selected from the II experimental group were calved. calved in stalls on a leash according to the technology adopted on the farm at three days of age, the young animals were placed in well-insulated houses, in which a layer of sawdust 20 -25 cm thick was laid, a layer of straw 25 -30 cm thick. straw was placed daily to provide the animals with a dry bed. The houses are made of plywood, covered with tarpaulin, have a canopy, length of the house is 2.5 m, width is 1.35, height is 1.8 m, length of the enclosure is 1.8 m, width is 1.30 m.

Calves of control groups I and II were under the experiment from birth to 2 months of age. They were grown according to the technology adopted on the farm. Cows calved in stalls, and during the preventive period (8-10 days), calves were kept in preventative areas. Subsequently, in groups of 5 heads, group pens are placed in the room. Dimensions length 3.5 m width 2.60 m height 0.94 m.

Animals from experimental group I and control group I were fed identically. During the preventive period, young animals were given whole milk at the rate of 6 liters per serving per day, then switched to whole milk substitute (WMS) - 700 grams of dry matter per day. Young animals of the II experimental group, the norm of milk replacer was increased to 750 grams per day, calves of the II control group received 600 grams of dry milk replacer per day throughout the entire experiment. With the onset of stable warm weather (beginning and mid-April), calves of the second experimental group received up to 600 grams of milk replacer. This time occurred in the second month of their cultivation. Young animals of experimental group II and control group II drank 6 liters of whole milk per day.

During the experiment, the temperature and relative humidity of the air in the room, houses and outside were measured daily, the ammonia content, and the speed of air movement were determined using generally accepted methods.

The growth and development of experimental animals was assessed by live weight and average daily increase in relative growth rate. All cases of disease in calves were regularly recorded, their consumption of whole milk, milk replacers, grass cuttings, coarse juicy, green and combined feeds was taken into account.

3 Results and discussion

The table presents data characterizing the microclimatic conditions for calves.

Table 1. Microclimate indicators.

Index	**Age**	**Group**			
		I-experienced	**I-control**	**II-experienced**	**II-control**
Air temperature (± O C)		To the premises			
	0 – 1	$\frac{-2.6}{-15+7}$	$\frac{+5}{+4+13.5}$	$\frac{+6}{-5+10}$	$\frac{+16}{+11+17}$
	12	$\frac{+3.8}{-10+12}$	$\frac{+10.4}{+7+16}$	$\frac{+8,2}{-0,3+20}$	$\frac{+14.2}{+10+17}$

Relative Humidity (%)	0 – 1	$\frac{66.5}{56-80}$	$\frac{78.6}{65-84}$	$\frac{67.9}{60-82}$	$\frac{70.2}{59-80}$
	12	$\frac{72.2}{40-50}$	$\frac{71.1}{64-79}$	$\frac{65}{49-80}$	$\frac{72}{52-80}$
Ammonia concentration (mg/ m3)	0 – 1	0	$\frac{3}{2-4}$	0	$\frac{5}{2-7}$
	12	$\frac{0.2}{0.1}$	$\frac{5}{2-7}$	$\frac{0,4}{0.2}$	$\frac{4}{1-7}$
	Outside				
Air temperature (± O C)	0 – 1	$\frac{-10}{-16+5}$	–	$\frac{0.3}{+1+8}$	–
	12	$\frac{+3.5}{-5+8}$	–	$\frac{+8}{+1+20}$	–
Air speed (m/s)	0 – 1	$\frac{2.3}{0-5}$	–	$\frac{2.6}{0-7}$	–
	12	$\frac{2.5}{0-6}$	–	$\frac{3.2}{0-9}$	–
Note	In the calculator the days are average values, in the denominator the range of their fluctuations				

Table 1 shows that we observed lower temperatures in the first month of raising calves. I – experimental group. In the den of the houses with the canopy closed at night, the air temperature exceeded the outside temperature by 5 – 6^{O} During the day, with the canopy open, the temperature inside the house was higher than outside. It should be noted that in calm, sunny weather, the calves spent most of the day in the enclosure, despite the very low outside temperature (-10 – 12^{O}C). During precipitation, as well as when the wind was not very strong, the young animals took refuge in the houses. The temperature in the room where the control animals were kept did not correspond well to the recommended standards for calves of the preventive and dairy rearing periods and was significantly lower than normal. The remaining parameters of the microclimate were in compliance with zoohygienic standards.

An analysis of the incidence of calves showed that gastrointestinal diseases were observed in young animals of the experimental and control groups. So, in the first experimental group 10% of sick animals in the second experimental group 15% in the first and second control groups, respectively 18% 25% The average duration of illness of one calf in the first experimental group was 1.3 days, in the control group 5.2 days in II – experimental and II control – 5.8 and 6.2 days, respectively.

The lowest incidence of disease in calves was found in experimental group I; no recurrent diseases were registered in this group, despite the fact that the calves of this group were kept in the coldest weather.

It must be emphasized that the calves in the experimental groups were exposed to low temperatures with significant differences, but no colds were registered in them.

With the same feeding scheme, calves in the experimental groups consumed more whole milk during the preventive period compared to calves in the control groups. Thus, in the first experimental group, the amount of whole milk spent on feeding one calf was 54.1 liters; in the control group it was 43.7 liters, or 23.8% less. In II - experimental and II control - respectively 54.5 and 48.5 liters or 12.4% less. This is explained by the good appetite of calves kept in individual houses in the fresh air.

From the age of 12 days, young animals of all groups were accustomed to eating high-quality roughage (grass cuttings and mixed feed). The animals were given free rein, and they themselves chose the food that best satisfied their physiological needs. The study of feed consumption showed that calves in the experimental groups consumed more grass cuttings and feed changes throughout the experiment than the control groups. The results obtained give grounds to draw the following conclusions that the advantage of coarse bulk feeds over concentrated feeds lies in their slower digestion, and therefore in the constant formation of energy necessary for the body of animals located in low temperature conditions. More active consumption of high-quality grass cuttings contributes to better development of the microflora of the digestive organs of the rumen, rumen digestion and the rumen itself, which, as is known, is an additional source of heat generation in cattle.

In general, during the experimental period, feed consumption per calf by group was as follows: I experimental group 146.9 feed units. (metabolic energy 892.1 MJ) I control group 148.22 food units (8991.5 MJ) II experimental group 120.1 food units (710.1 MJ), II control group 115.8 food units (659.9 MJ).

Table 2. Growth indicators of experimental calves.

Age Calves (months)	**Group**			
	I-experienced	**I-control**	**II-experienced**	**II-control**
At birth	Live weight (kg)			
	31.7	32.2	31.4	31.8
1	47.6	46.3	43.3	44.8
2	72.9	68.7	64.2	64.4
Average daily gain (g)				
1	530	470	400	443.3
2	843	740	696	653
Relative growth (%)				
1	40.15	35.7	32	34
2	42	39	38.9	35.9

So thus, in experimental group I and control group I, feed consumption was at the same level; in experimental group II, compared to control group II, it was slightly higher due to the greater consumption of milk replacer by calves in the first month of their rearing. Table 2 shows that the growth rates of calves in different periods the periods were not the same. Thus, in the monthly return of calves of all groups, the average daily gain in live weight and relative growth rate were lower compared to these indicators at 2 months of age, which is associated with the incidence of dyspenia in newborn calves. The average daily gain and relative growth rate in calves of experimental group I were 12-14 and 12-8% higher than those of the same age in control group I.

By comparing the growth indicators of calves of the II experimental and II control groups, a decrease in the average daily gain in experimental calves at one month of age was established by 12%, despite the fact that they received increased feed with milk replacer. In all likelihood, this was due to the high incidence of gastrointestinal diseases in calves, which, combined with low temperatures, negatively affected their productivity. At 2 months of age, the average daily gain in live weight and the relative growth rate of calves kept in the fresh air compared to the control increased by 6.5 - 8.4%, respectively. Naturally, in addition to fresh air, this was facilitated by active exercise and ultraviolet irradiation.

Analysis of data on feed costs per 1 kg of live weight gain showed that the indicator largely depended on the productivity of calves and changed in accordance with changes in average daily gain. Thus, animals of experimental group I at the age of 1 month consumed 3.7 feed units per day. at the age of 2 months 3.63 in animals of control I, respectively, 3.92

and 4.17 food units or 5.9 and 13% higher than in peers. In experimental group II heifers, feed consumption at one month of age was 5.02 feed units II control 3.81 food units (31.8% lower) At 2 months of age, feed costs in experimental group II decreased by 9.9% compared to the control group due to the increased growth of live weight, amounting to 3.09 and 3.43 feed units, respectively, for the groups.

4 Conclusion

Thus, scientific and economic experience carried out in the earthly - spring period has shown that when raising newborns and calves in dispensary houses in the open air, it is necessary to strictly comply with a number of favorable conditions for calving cows should take place in stalls: newborn calves must be kept in place for 24 hours with mothers; Careful care of calves and their temporary feeding, daily addition of dry straw bedding should be provided.

Young animals raised in the open air, subject to all these above- mentioned conditions, are significantly less susceptible to gastric and intestinal diseases, grow better and use high-quality roughage more.

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