The effect of senage as a low-concentrate type feeding racion in feeding cows and their productivity and fertility when using silage feeds

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Abstract. The article presents the effect of senage made during the wax ripening period of the grain of the head of the triticale plant from intermediate crops, as well as their effect on the productivity and fertility of cows when using silage prepared during the wax ripening period of corn grain as a low-concentrate type feed. Keywords: feed unit, exchangeable energy, dry matter, milk productivity, protein, fat, kletchatka, carbohydrate, vitamin, hormone, impotence, sexual predisposition, service-cycle.

1 Relevance of the topic

In the strategy of action on the five priority areas of development of the Republic of Uzbekistan in 2017-2021, the tasks of developing livestock on a scientific basis, further increasing the productivity of agricultural animals, further improving the productivity, livestock and other characteristics of cattle, organizing a high level of feeding, creating their productive herds are outlined.

For the 30th and 32nd purposes of the development strategy, approved by the decree of the president of the Republic of Uzbekistan "on the development strategy of new Uzbekistan for 2022-2026"dated January 28, 2022, the task is to increase the income of farmers and farmers at least 2 times through the intensive development of Agriculture on a scientific basis, increase the annual [1-5].

It follows that when feeding cattle and setting feed standards, more than 30 indicators of nutritious substances and mineral elements are taken into account. These are provided with the content of dry matter in ration, the amount of energy in dry matter, protein, digestible protein, fat, sugar, starch, kletchatka, vitamins A (carotene), D and E, as well as the required level of macro-and microelements. In increasing the productivity of goods, it is important to follow the rules of zootechnics and veterinary medicine. It is known that when feeding livestock is carried out in the norms recommended by science, taking into account their physiological state, productivity, living weight, period of milking in cows, breed and other technological indicators, the cattle are healthy and their productivity indicators and genetic capabilities can be fully exploited [6-10].

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When low-concentrate type feed rations are used to improve livestock feeding, it is important to saturate them with proteins, carbohydrates, fats, which are lacking in the dry matter contained in the ration, as well as the place of vitamins, minerals [11-14].

At present, 30-38 percent of the concentrate feed used in farms - bran, meal and "mixed feed" is mainly purchased. Bran, meal and "mixed feeds" do not meet the requirement in terms of their full value because they are not sufficiently saturated with protein, vitamins and minerals. Nutrient deficiencies in the diet can be replenished by adding silage from intercrops and silage from various corn grains to the feed mixture.

2 Scientific innovation

For the first time in improving the feeding of livestock, the technology of filling the missing nutritious substances in feed rations of cattle with a low concentration type is developed.

In this case, research is carried out on the use of senage prepared from intermediate crops on the duration of vegetation during different ripening periods of triticale, as well as silage prepared during different ripening periods of the grain of the corn plant.

Practical significance. In order to improve the productivity of dairy cattle and improve the quality indicators of milk, improve the pustiness properties of Mother cattle, in order to develop the technology for the use of senage and silage feed in the filling of nutritious substances missing in the ration, it is important to develop practical importance.

The purpose of the study. Development of technology for the use of low-concentrate type feed rations in the improvement of livestock feeding.

Object of study. Milking in the experimental group is considered cows.

The subject of the study is: senage made from intermediate crops and silage made from corn plant.

3 Senaj preparation technology

Senaj – it was made from a mixture of legumes, legumes and cobs. Senaj was considered more advantageous in some of its characteristics than hay. In the process of its preparation, nutrients are reduced to 3.4%.

In the senaj, the most useful parts of the plant are preserved-flowers, spikes and leaves.

In the preparation of senaj, we also used the mass of the tritekale plant during various vegetative periods from intermediate crops. To do this, during the flowering period of the spike of the triticale plant, grown in the fields overlooking the experimental plot of our institute, during the period of milk ripening, as well as during the periods of wax maturation of the grain, reap the Blue Mass and grind and selgitib 200 l. the glue was placed in barrels and compacted well, covering the top in polyethylene plugs and closing the lid, and the barrels were inscribed with the date and other information they had been wrapped and placed in a file and glued to the barrels using a scoop.

In addition, the alfalfa in the field overlooking the experimental plot of the institute was wrapped in a blue mass during the flowering period and brought to the farm for the purpose of making a senaj, which was taken from the same mass and compacted into 1 plastic barrel, carefully covering the mouth and pasting paper on the label into a file into a barrel. After the sennage in the containers, samples were taken from them and put them in plastic bags. In addition, on the farm farm where we were experimenting, a senage was prepared from a mixture of Sully grain. We also took a sample in a plastic bag and handed it to the laboratory of the State Center for the diagnosis of animal diseases of the Republic and the safety of food products, along with samples in other packages, to determine the chemical composition. (Table 1). We can see the results of the check from Table 1.

Table 1. The chemical composition of senaj made from various plants

Analysis name	Trouble senage,%	Oatmeal mixture grain,%	During the milk ripening period of the grain of treticale Senaj, %	Treticale senaj during flowering,%	Grain of treticale senaj during wax ripening,%
Initial humidity	79,91	57,74	64,46	76,13	26,59
Humidity	4,71	3,96	5,73	7,34	4,95
Raw kul	9,79	9,24	17,68	9,93	8,34
raw protein	9,32	6,94	10,37	11,87	9,02
Raw oil	3,08	5,63	2,21	3,23	2,12
Raw kletchatka	34,88	31,29	32,20	32,23	34,98
Calcium	1,44	0,74	0,49	0,71	0,88
Phosphorus	0,15	0,24	0,12	0,14	0,31
Acidity level	$12,4^0$	$4,4^0$	$31,2^0$	20^0	6^0

From the results of the laboratory diagnosis in Table 1 above, it became known that according to the chemical composition of senage made from blue mass of various plants, the senage prepared from the wax ripening period of the grain of the triticale plant on the storage of protein, fat, cuttlefish, nitrogen-free extractive substances was high.

Even in terms of satiety, the prepared senage during the wax ripening period has acquired a high satiety. This can be seen from Table 2 below.

Table 2. Satiety of senage, which is prepared by reaping the grain of different plants during different ripening periods

Food type	Acidic, in pH ternary	Pointer type	Available in food					Energy food unit	In the food unit
			Protein	fat	Kletchatka	AEM	alternating energy, MDj		
Alfalfa hay,%	12,4	in g/kg	18,7	6,2	70,0	86,3	-	-	
	6,8-6,9	AE	0,40	0,13	0,11	1,11	1,75	0,17	0,14
Senage prepared with oat grain	4,4	in g/kg	32,80	31,33	147,88	216,9	-	-	
	7,3-7,4	AE	0,69	0,67	0,24	2,80	4,40	0,44	0,33
A silage made from the mass of Triticale during flowering	31,2	in g/kg	28,33	7,71	76,93	102	-	-	
	6,8-6,9	AE	0,60	0,17	0,12	1,32	2,20	0,22	0,16
Hay during the milk ripening period of triticale plant	20	in g/kg	34,78	7,41	108,00	125,9	-	-	
	6,41-6,35	AE	0,73	0,16	0,17	1,62	2,69	0,26	0,20
Cereal made from triticale plant during	6	in g/kg	66,22	15,56	256,79	334,3	-	-	

wax ripening period	7,5-7,6	AE	1,40	0,34	0,41	4,31	6,45	0,64	0,48

From the data of Table 2 above, it turned out that when we analyze the satiety of the grain of the triticale plant during different ripening periods, as well as senage made from other plants, it turned out that the prepared senage during the wax ripening period of the grain of the spikes of the treticale plant had a high satiety.

4 Silage preparation technology

Silage is made from corn, white sorghum, sudan grass and sunflower. Silage is fed to all livestock, especially cattle. Silage has a lot of carotene, which makes it different from root crops.

The chemical essence of ensiling is that sugar in plants is converted into lactic acid due to the activity of lactic acid-producing bacteria. Like other acids, lactic acid destroys harmful bacteria. Lactic acid-producing bacteria live in an anaerobic, that is, an oxygen-free environment.

After that, we reaped the mass of corn grain at different ripening periods for silage, crushed it into barrels, concentrated it, and determined its chemical composition and nutritional value in the laboratory.

In order to determine the chemical composition of the silage prepared in plastic barrels, we poured the silage in the barrels on the ground, mixed the mass in them, took samples from them, and studied its chemical composition in the laboratory of the State Center for the Diagnosis of Animal Diseases and Food Products Safety of the Republic. We can see it from the data in Table 3 below.

Table 3. Chemical composition of silages made from the blue mass of corn grain at different ripening periods

Analysis name	Milk ripening period of corn silage grain,%	During wax ripening of corn silage grain,%	During the period of complete ripening of corn silage grain,%
Initial humidity	71,22	69,16	69,99
Moisture	5,35	7,88	4,88
Raw ash	10,53	6,29	4,61
Crude protein	7,06	6,78	6,49
Raw tissue	29,88	22,43	21,64
Calcium	0,94	0,48	0,44
Phosphorus	0,22	0,21	0,12
crude oil	1,29	1,46	2,07
Acidity level	$38,4^0$	$24,4^0$	$21,2^0$
Toxicity	**Not toxic**	**Not toxic**	**Not toxic**

From the data in Table 3 above, it was found that when the chemical composition of the silage made from the blue mass of the corn grain was studied at different ripening periods, the raw protein, crude fiber, crude oil, and calcium and phosphorus content of the feed were studied during the wax ripening period of the corn grain. prepared silage is acceptable. This can be seen from the data presented in Table 4 below.

Table 4. Nutritional value of silage made from corn grain at different ripening periods

Food type	Unit of measure	Protein	fat	Kletchatka	AEM A unit of measure for the amount of energy exchanged	Energy in the feed unit	In the food unit
During the period of milk ripening of corn silage grain	in g/kg	2,46	0,45	10,38	270,9	0,35	0,26
During wax ripening of corn silage grain	in g/kg	2,56	0,47	7,27	296,1	0,39	0,29
During the period of complete ripening of corn silage grain	in g/kg	2,16	0,69	7,21	287,9	0,37	0,27

From the table 4 above, it is known that the silage made from corn has the highest satiety in the wax ripening period of the corn grain.

Summary. As a result of our research, it was found that the silage made from intercrops during the wax ripening period of the triticale plant was superior in terms of its chemical composition and nutritional value compared to those prepared in other vegetation periods. Among the silages prepared at different ripening periods of corn grain, it was found that the silage prepared from the blue mass of corn grain at the wax ripening period had high indicators in terms of chemical composition and nutrition.

5 Place of experiment

Scientific and research work was carried out on the cows of the cattle farm at the farm "Shalola Abduqakhor Chorvador" of the Qibray district of the Tashkent region. For the experiment, cows were selected into 3 groups of 10 cows, taking into account their similar characteristics, productivity, and age.

(Ovsyanikov A.I., 1979)

6 Carrying out research work

Research work was carried out on the basis of the work plan, work method and work program and planned research.

1 of the 3 groups formed is the control group. Cows in this group were preserved and fed on the basis of the technology adopted in the farm.

Cows in experimental groups I and II have been improved and optimal conditions have been created. During the winter, the experimental cows were kept in buildings with large bright rooms and dry breeding grounds. In the spring and summer seasons, cows of this group were kept in buildings with large grazing areas, and during hot summer days, part of the grazing areas were kept in high terraces that partially blocked the sunlight.

In feeding, the effect of replacing 20% of wheat bran with wheat bran in the feed ration of cows of the I-group with haylage was studied on their flexibility and productivity and on the quality indicators of their milk products.

Cows of experimental group II were replaced by 20% of wheat bran and wheat bran with silage feed, and the effect on milk yield and quality indicators was studied.

7 Feeding experienced cows

Analyzing the composition of feed rations for feeding cows on the farm, seasonal feed rations were prepared to compensate for the missing proteins, carbohydrates and vitamins, and 20% of the bran and bran in the feed ration were replaced by hay and silage.

In the farm, you can see the feed ration prepared in winter seasons, in which the types, amount, satiety, feed unit and amount of dry matter and other indicators of feed are determined.

Table 5. Feeds fed to experimental cows during the experimental period

amount in groups (per head)

№	Indicators	Unit of measure	Control group	Experimental group I	II-experimental group
1.	**Hay of various grasses**	kg	1320	1309	1296
2.	**Wheat straw**	kg	2640	2625	2620
3.	**At the bar**	kg	9900	6510	6460
4.	**Wheat bran**	kg	1324	1055	1045
5.	**molasses**	kg	330	330	330
6.	**All kinds of herbs**	kg	2811	4835	2801
7.	**Corn silage**	**kg**	6655	6600	9600
8.	**Table salt**	kg	26,72	26,72	26,72
9.	**Total amount of feed consumed, feed per**	kg	5718,39	5685,77	5675,72
10.	**Dry matter**	kg	8662,2	8969,4	8794,6
11.	**Exchangeable energy**	Mdj	66449,1	73391,7	73039
12.	**Crude protein**	gr	1120428,5	1119045	1097270
13.	**Digestible protein**	gr	706011	616590	608608
14.	**crude oil**	gr	315924	293531	301879
15.	**Raw tissue**	gr	2373664	2631967	2531485
16.	**Starch**	gr	57456,5	125325	118815

17.	**Sugar substance**	gr	346001	400545	371148
18.	**Calcium**	gr	46990,9	55487	49580,1
19.	**Phosphorus**	gr	30059,7	28681,5	27681,3
20.	**Potassium**	gr	199945,3	178478,9	213317,8
21.	**Magnesium**	gr	17454,5	18871,7	17360,6
22.	**Sulfur**	gr	15847,5	17079,2	17601,2
23.	**Iron substance**	mg	2725968	3088935	2869388
24.	**Copper**	mg	61895,8	68928,3	68888,8
25.	**Zinc**	mg	297840	304384,5	288833,1
26.	**Manganese**	mg	519065,6	560961,5	521283,3
27.	**Cobalt**	mg	2814,65	3098,1	2854,1
28.	**Iodine**	mg	4700,7	4399,5	4496,1
29.	**Carotene**	mg	372917,4	420378	489282
30.	**Vitamin-D**	x.b.	1362055	1719560	1606420
31.	**Vitamin-DE**	mg	486196,6	548444,5	626785,5

From the above table 5, it was found that among the groups, in terms of feed consumption per cow, it was 5675.72 to 5718.39 kg per cow during the experimental period. Although this was not a significant difference, it was found that there were different indicators of consumption of nutrients in the consumed feeds (fig.1).

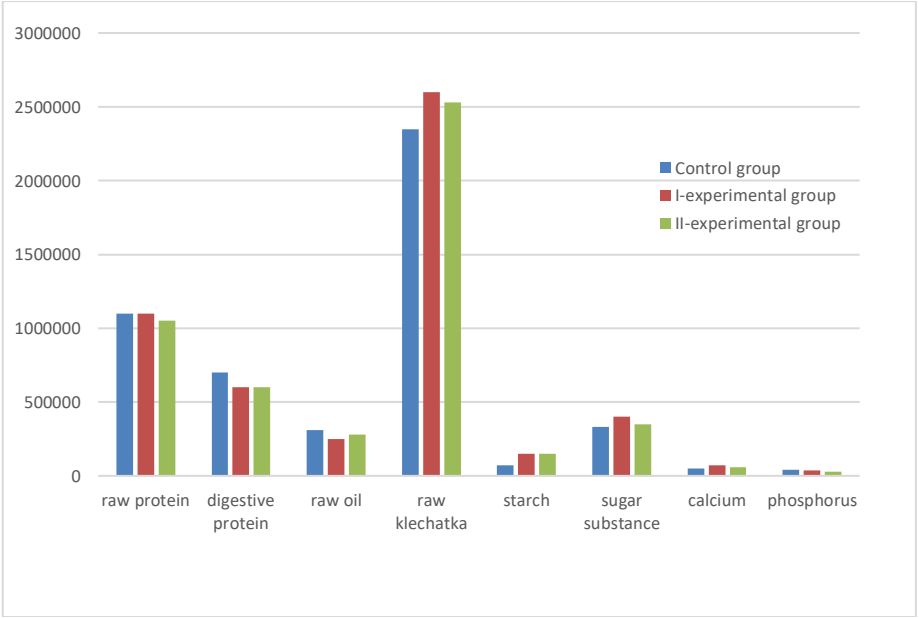

Fig.1. Feeds used in experimental animals quantity.

It was found that the amount of dry matter was consumed by 307.2 kg more in the cows of experimental group I than in the control group, and by 174.8 kg more in cows of experimental group II.

Starch was consumed by 67868.5 g more in experimental group I than in control, and by 61358.5 g more in experimental group II.

The amount of sugar contained in the diet was 54544 g more in experimental group I than in the control group, and 25147 g more in experimental group II.

It was found that the consumption of calcium, magnesium, iron, copper, zinc, manganese, cobalt, especially carotene, Vitamin-D and Vitamin-E was higher in the cows of experimental group I and II than those in the control group. In order to make it clear, we decided that some substances, especially macro and microelements, carotene and vitamins, are stored in hay and silage.

As it is important to study the level of coverage of feed with milk during the lactation period of dairy cows, we can see it from the data of table 6 below.

Table 6. The level of coverage of feed with milk during the lactation period of cows in the cross-section of groups

Indicators	Measurement unit	Control group	I Experimental group	II Experimental group
The amount of milk expressed is in physical condition during the experiment	kg	5451,12	6093,10	5914,61
Compared to control	%	100	111,77	108,50
Amount of feed consumed per head of cow	kg	5718,39	5685,77	5675,72
Compared to control	%	100	99,42	99,25
The amount of natural fat in milk	%	3,82	4,15	4,14
Compared to control	%	100	108,63	108,37
The amount of milk with a fat content of 4%	%	5205,81	6321,59	6121,62
Compared to control	%	100	121,43	117,59
Feed unit used to produce 1 kg of milk at natural fat content	kg	1,04	0,93	0,95
Compared to control	%	100	89,42	91,34
Feed unit used to produce 1 kg of milk with a fat content of 4%	kg	1,04	0,89	0,92
Compared to control	%	100	85,57	88,46

As can be seen from the 6th table above, replacing 20% of the main feeds in the daily rations with haylage and silage had a positive effect not only on the milk yield of cows, but also on the level of fatness and coverage of feed with milk.

The unit of feed used to produce 1 kg of milk at natural fat content was 0.11 kg less in the cows of experimental group I than in the control group, and 0.09 kg less in experimental groups II.

For the production of 1 kg of milk with a fat content of 4%, experimental group I consumed 0.15 kg less than the control group, and experimental group II consumed 0.12 kg less than the control group.

The obtained results showed that the replacement of 20% of the main feed in daily rations with haylage and silage reduces feed consumption in the experimental groups by 9-11%.

8 Milk productivity of cows and their quality indicators

In order to study the milk productivity of cows and changes in its quality indicators, monthly control milking is carried out.

In this case, the amount of milk milked from each head of cow was measured with the help of a milk meter during milking 3 mahals in one day through the portable milking equipment AMS-200, and the amount of milk that was milked from each head of cow during the day was determined.

As a result, it became known that the milk yield of cows in the control group during the experimental period was on average 5451.12 kg of milk from each head of cow, and 60931 kg of milk was milked from each head of the experimental group, and on average -641.98 kg compared to the control group. from, i.e. 11.77% more milk was obtained.

5914.61 kg of milk was milked from the II-experimental group, which means that milk was milked by 8.50% more than the control group (fig.2).

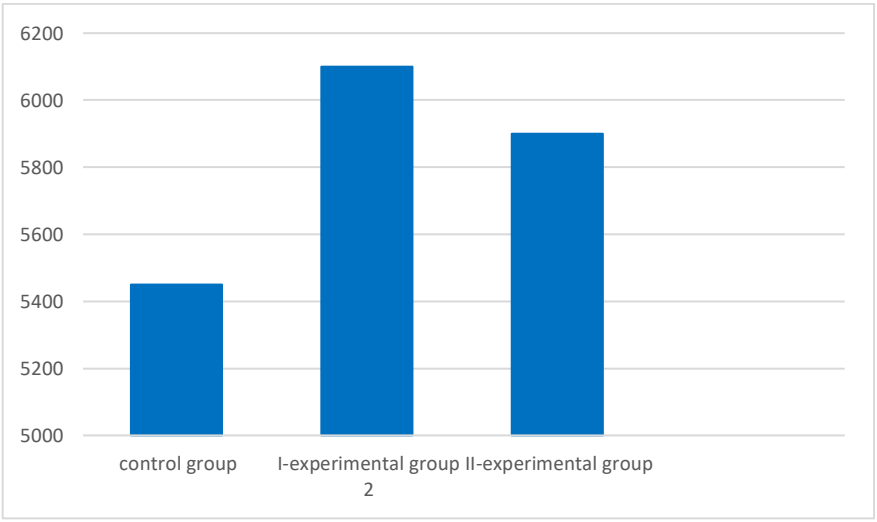

Fig. 2. Annual milk production of cows, by groups.

In order to study the quality indicators of milk, during control milking, milk samples from 3 cows of each group were taken into containers during each milking, using the "Lactan 1-4 m" equipment, the content of milk fat, protein content, skimmed milk residue and milk density were tested. was studied during the period.

Based on the obtained data, we determined the amount of dry matter in the milk based on a special formula. From the obtained data, it became clear that the average amount of fat in the milk of the cows in the control group was 3.82% during the experimental period, and the amount of fat in the milk of the cows in the experimental group was 4 , making up 15%, this indicator increased by +0.33% compared to those in the control group, it was found that these indicators of cows in experimental group II were 4.14% and increased by 0.32% compared to those in the control group. We concluded that the reason for this was that 20% of the bar feed in the feed ration of the cows in the experimental group was replaced by haylage and corn silage. Because the amount of dry matter, crude fiber, starch, sugar, calcium, potassium, magnesium, copper, zinc, manganese, cobalt, carotene and vitamins D and E in the feed ration of the cows in the experimental group was probably due to the fact that the cows in the control group were more preserved than those in the feed ration. we came to a conclusion (fig.3).

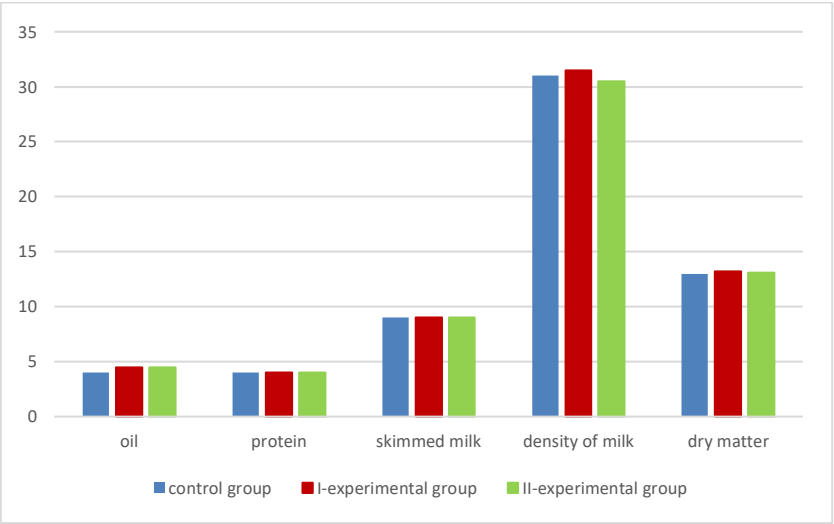

Fig 3. Milk quality of experimental cows average indicators

Regarding the dry matter content of the milk, it was found that the dry matter content of the milk of the cows in the experimental group was also high. Therefore, we believe that the reason for the high content of dry matter in milk is the high dry matter in the feed ration of the cows of experimental groups I and II.

9 Fertility indicators of experimental cows

It is important to study the changes in their fertility indicators in cattle breeding. The reason for this may depend on the state of conservation conditions, the complete value of the feed ration and other reasons.

In phase II, we kept the cows in the control group based on the technology adopted on the farm, and the cows in the experimental groups I and II were kept in new buildings specially built on the farm during the winter. In the spring and summer seasons, optimal preservation conditions were created, and during the hot summer days, they were kept on high terraces that blocked the direct sunlight over the spreading areas. The influence of the conditions of keeping the cows in the experimental group on the milk yield and its quality indicators and the influence of the fertility characteristics was also studied.

In feeding, the chemical composition and nutritional value of the feeds used in the feed ration were determined, and the replacement of 20% of the wheat bran with silage and haylage was carried out, according to the nutritional content of the feed ration of the cows of the I and II experimental groups.

In addition, the cows in the experimental groups were separated from the cows that were not clearly affected.

Cows that arrived at the pit were separated, taken to special places for artificial insemination and tied up, where artificial insemination of cows was carried out.

Newly born cows were examined by a doctor, veterinary measures were carried out, and positive indicators of fertility indicators were achieved.

The results of the above work are as follows. We can see from table 7.

Table 7. Fertility indicators of cows in the experiment, by groups

Indicators	Those in the control group	Those in experimental group I	Those in experimental group II
Fertility at first insemination, %	65,3	78,1	73,4
Total fertilized,%	71,5	87,2	84,3
Duration of the service period, days	120	85	89
Escape index,%	1,75	1,46	1,52
Duration of the strait, days	285	282	283

From the table 7 above, it was found that the total fertilization of cows was 15.7% higher in experimental group I than the control group, and 12.8% higher in experimental group II.

Regarding the duration of the service period, compared to the control group, it was found that cows in experimental group I decreased to 35 days, and those in experimental group II decreased to 31 days.

According to the escape index, it was found that the cows of the I-experimental group decreased by 0.29% compared to those in the control group, and by 0.23% in the II-experimental group.

It was found that the duration of constipation was within the norm without significant changes between the groups (fig.4).

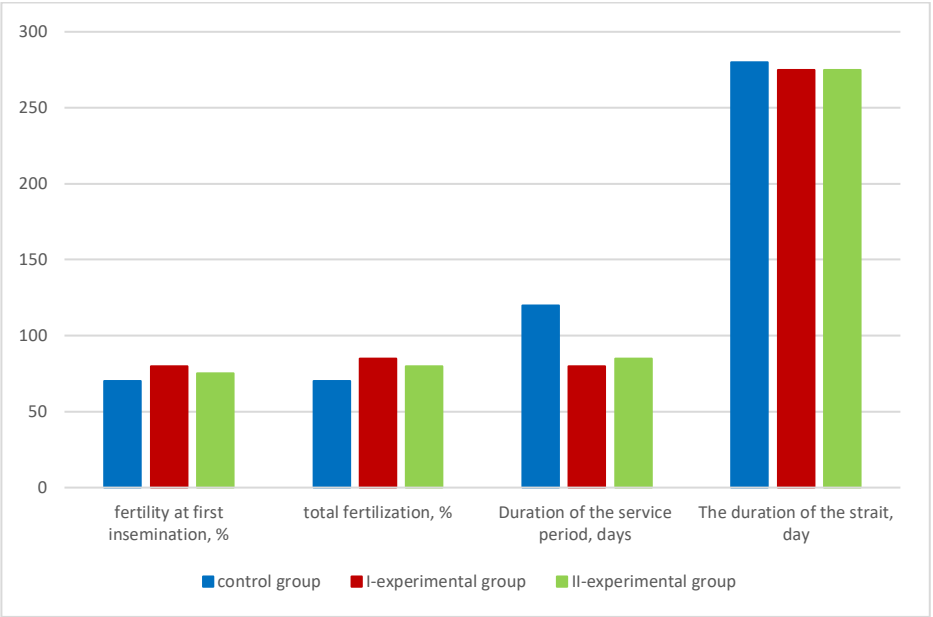

Fig. 4. Fertility indicators of cows in experimental groups.

From the above information, it was found that when the conditions of keeping cows are improved, when the feed rations have full value, and when they are carried out during other zootechnical and veterinary activities, they have a positive effect on the fertility indicators of cows.

10 Conclusions

1. Cows in different periods, taking into account their demand for feed
improves feeding rations with their full value and mineral balance, eliminating the amount of proteins, carbohydrates, and vitamins lacking in the ration by adding silage and silage feed, and improves fertility properties;

2. In terms of economic efficiency, from the cows of the I-experimental group
It was found that the obtained efficiency was 49.61% higher than that of the control group, and the efficiency of the II-experimental group was 43.08% higher than that of the control group.

References

1. Akmalkhanov Sh.A. i. dr. Biological and zootechnical fundamentals dairy farming in Uzbekistan. (Book: Tashkent. "Mekhnat", 1993)
2. Akmalkhanov Sh.A., Jumadullaev B.Kh., Yuldoshev D.Q., Komilov A.A., Imankulova K.A., Gulmatova N.A. "Recommendation" on keeping, feeding and improving the characteristics of cattle-(Tashkent-2020)
3. Ashirov B.M., J. "Zooveterinaria" **3**, 31 (2014)
4. Ashirov M.E., Ro'zibaev N.R., Ashirov B.M., Soatov O'.R., Yusupov K. Recommendation on mixed feeding of cows. (Tashkent-2013)
5. Rozibaev N.R., Soatov O'.R., Ashirov B.M., J. "Zooveterinaria" **8 (117),** 37-38 (2017)

6. Nosirov U.N., Maksudov I., Dosmukhamedova M.Kh. "In Uzbekistan cattle breeding development factors" (Tashkent-2011)
7. Yuldashev D.K., J. "Livestock and Breeding Work" **2 (24),** 47-48 (2022)
8. Hafizov I., Kuchchiev M., Hafizov A. Full size livestock let's get feeding. J. "Zooveterinaria" **6-7,** 63-64 (2008)
9. **13.** Khodjaev U., Khalikov Kh., J. "AGROILM 2, 64-65 (2018)
10. Khusainova V., Toshpolatova E. Physiology of agricultural animals (Tashkent. 1994)
11. Menglikulov, B., Umarov, S., Safarov, A., Zhyemuratov, T., Alieva, N., & Durmanov, A. (2023). E3S Web of Conferences (**Vol. 389,** p. 05036). https://doi.org/10.1051/e3sconf/202338905036
12. Narinbaeva, G., Menglikulov, B., Siddikov, Z., Bustonov, K., & Davlatov, S. (2021). E3S Web of Conferences (**Vol. 284,** p. 02009). https://doi.org/10.1051/e3sconf/202128402009
13. Menglikulov, B., Dusmuratov, R., & Mamadiyorov, D. (2021). E3S Web of Conferences (**Vol. 258, p**. 04036). https://doi.org/10.1051/e3sconf/202125804036
14. Uralovich, K. S., Toshmamatovich, T. U., Kubayevich, K. F., Sapaev, I., Saylaubaevna, S. S., Beknazarova, Z., Khurramov, A. (2023). Caspian Journal of Environmental Sciences, **21(4),** pp. 965-975. doi: 10.22124/cjes.2023.7155