

Level of Carbohydrate Metabolism in Cows in Uzbekistan Conditions

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Annotation: The article presents the results of a blood glucose test in heifers and cows of different ages, depending on the periods of pregnancy, lactation, type of feeding, as well as soil, climatic and environmental conditions of the region. The time of the most pronounced disorders of carbohydrate metabolism in cows has been established. The parameters of carbohydrate metabolism characteristic of healthy and sick cows with impaired carbohydrate metabolism under conditions of silage-concentrate and hay-concentrate types of feeding have been established.

Keywords: Metabolic disease. Dairy cows. Metabolic level cartograms. Blood glucose. Hypoglycemia. Lactation periods. Pregnancy. Extreme environmental situation. Early diagnosis. Group prevention. Clinical examination.

Relevance. In solving the tasks set by the government of the Republic of Uzbekistan to deepen agrarian reforms aimed at providing the population of the republic with livestock products, major obstacles are metabolic diseases in productive animals, including impaired carbohydrate metabolism in dairy cows. Thus, the results of our research show that on average 30-70% of cows suffer from diseases of metabolic disorders, the consequences of which are severe weight loss, a noticeable decrease in milk production, the birth of low-viable young animals, increased feed consumption per unit of production, forced slaughter of sick cows and etc. The main properties of these diseases are a latent course over a relatively long period and a massive coverage of the number of animals in a group, which makes timely diagnosis and successful prevention difficult. Based on this, work aimed at developing methods for timely diagnosis and measures to prevent metabolic disorders, including carbohydrate metabolism in cows, is relevant.

Analysis of the literature data shows that, despite the fact that world scientists (I.G. Sharabrin, M.Kh. Shaikhamanov, I.P. Kondrakhin, Kh.Z. Ibragimov, V.I. Levchenko, L.Vrzgula, K.N. Norbaev and others) significant results were achieved in the diagnosis and prevention of metabolic disorders in productive animals, the development of methods for early diagnosis and group prevention of carbohydrate metabolism disorders in cows in the conditions of Uzbekistan, depending on age, type of feeding, periods of pregnancy and lactation, as well as the environmental situations of the region are considered unresolved.

Materials and research methods. The amount of glucose in the blood was determined in heifers and cows of the first, second, third, fourth and fifth calving, fed silage-concentrate and hay-concentrate types of feeding in the conditions of farms in Samarkand, where the environmental situation is relatively adequate, as well as in Bukhara and Kashkadarya regions, where the environmental situation is extreme for the animal body.

Test results. In the conditions of the Samarkand region, where the ecological situation for the animal body is relatively adequate, in heifers fed silage-concentrate feeding, the amount of glucose in the blood in the first month of pregnancy averaged 1.98 ± 0.01 Mmol/l and by the 3rd month of pregnancy decreased to 1.88 ± 0.01 Mmol/l. With the deepening of pregnancy (starting from 4 months), a gradual increase was observed and by the end of which it averaged 2.2 ± 0.02 Mmol/l. A greatly reduced level of carbohydrate metabolism in 1, 2, 3, 4, 5 months of pregnancy, definitely in all cases in 10% of animals.

In the hay-concentrate type of feeding, the amount of glucose in the blood in the first month of pregnancy averaged 1.96 ± 0.01 Mmol/L, and its decrease continued until 4 months (1.82 ± 0.01 Mmol/L). Starting from the 5th month of pregnancy, a dynamic increase was observed and by the end of which it reached 2.0 ± 0.02 Mmol/l. A greatly reduced level of carbohydrate metabolism was observed in 1, 2, 3, 5, 6 and 7 months of pregnancy, definitely 10% each, and in 4 months - in 20% of animals.

In first-calving cows fed silage-concentrate type of feeding, the amount of glucose in the blood in the first month of lactation averaged 2.24 ± 0.02 Mmol/l. With increasing lactation, a noticeable decrease was observed and by the 5th month it averaged 1.82 ± 0.01 Mmol/l. Starting from the 6th month of lactation, it dynamically increased and by the end of the dry period it averaged 2.01 ± 0.02 Mmol/l. A strongly reduced level of carbohydrate metabolism was observed from the 3rd month of pregnancy to the first month, definitely in 10% of animals.

In the hay-concentrate type of feeding, the amount of glucose in the blood in the first month of lactation averaged 2.0 ± 0.02 Mmol/l, and its decrease continued until the 6th month (1.72 ± 0.01 Mmol/l). Starting from the 7th month of lactation (1.75 ± 0.01 Mmol/l), its dynamic increase was observed and by the end of the dry period it reached 1.9 ± 0.02 Mmol/l. A strongly reduced level of carbohydrate metabolism was found in 2, 3 and 4 months of lactation in 10%, in 5, 6 and 7 - clearly in 20%, in the 8th month of lactation and in the dry period - in 10% of animals.

In cows of the second calving both in silage-concentrated and hay-concentrated types of feeding, the amount of glucose in the blood dynamically decreased until the 6th month of lactation (respectively from 2.12 ± 0.002 to 1.71 ± 0.001 and from 2.05 ± 0.02 to 1.68 ± 0.001 Mmol/l), and then a gradual increase was observed and by the end of lactation it reached 1.98 ± 0.02 and 1.92 ± 0.02 Mmol/l, respectively. A greatly reduced level of carbohydrate metabolism under conditions of the silage-concentrate type was observed starting from the 2nd month of lactation until the first half of the dry period (10% of animals each), under conditions of the hay-concentrate type - in all conditions of lactation and dry wood (10-20% of animals each).).

In cows of the third calving, in both types of feeding, the amount of glucose in the blood decreased noticeably compared to the previous calving. Thus, in the silage-concentrate type, the amount of this indicator in the first month of lactation averaged 2.02 ± 0.02 Mmol/l and its dynamic decrease continued until the 6th month of lactation (1.59 ± 0.01 Mmol/l), and then - an increase until the end of the dry period (1.82 ± 0.01 Mmol/l). In the hay-concentrate type of feeding, the decrease in this indicator continued until the 7th month of lactation (from 1.97 ± 0.002 to 1.55 ± 0.001 Mmol/l). By the end of the dry period, the amount of this indicator increased only to 1.77 ± 0.01 Mmol/l. A greatly reduced level of carbohydrate metabolism in the silage-concentrate type of feeding was noted in 3 (10%), 4 (20%), 5 (30%), 6 (30%), 7 (30%), 8 (20%) months lactation and in the first half of the dry period (10%), hay-concentrate - in 2 (10%), 3 (10%), 4 (20%), 5 (30%), 6 (30%), 7 (30%), 8 (20%) months of lactation and in the dry period (in the first half in 20%, in the second - in 10% of animals).

In cows of the fourth calving both in conditions of silage-concentrate (from 2.02 ± 0.002 to 1.8 ± 0.01 Mmol/l) and in conditions of hay-concentrate (from 1.97 ± 0.2 to 1.78 ± 0.01 Mmol/l) type of feeding, at the beginning of lactation there was a noticeable decrease in the amount of glucose in the blood compared to the previous calving. The dynamic decrease in this indicator under general conditions continued until the 6th month of lactation (up to 1.60 ± 0.01 and up to 1.62 ± 0.01 Mmol/l). By the end of the dry period it increased to 1.76 ± 0.01 and 1.70 ± 0.0 Mmol/l, respectively. The greatly reduced level

of carbohydrate metabolism was 10% in the silage-concentrate type of feeding in the 1st month of lactation and the end of the dry period, 20% in 2, 3, 4, 5, 8 months of lactation and the beginning of the dry period, 6 and 7 months of lactation - 30% of animals. In hay-concentrate - in the 1st month of lactation - 10%, in the 2nd and 3rd months of lactation and in the dry period - 20% each, in 4, 5, 6, 7 and 8 months of lactation - 30% of animals.

In cows of the fifth calving, a noticeable decrease was also observed at the beginning of lactation (from 1.80 ± 0.01 to 1.70 ± 0.01 Mmol/l in silage-concentrate and from 1.78 ± 0.01 to 1.66 ± 0.01 mmol/l in the hay-concentrate type of feeding) the amount of glucose compared to the previous calving. The dynamic decrease in this indicator under general feeding conditions persisted until the end of lactation (to 1.60 ± 0.01 and to 1.56 ± 0.01 Mmol/l, respectively). A strongly reduced level of carbohydrate metabolism under conditions of silage-concentrate feeding was noted in 1, 2, 3, 4, 5, 6 and 7 months of lactation by 20%, in the 8th month - 30%, in the dry period - by 20% of animals. Under conditions of hay-concentrate feeding - in 1, 2, 3, 4, 5, 6, 7 and 8 months of lactation - 20, 20, 20, 30, 30, 30, 40, 40%, in the dry period - 30% each animals.

Analysis of the research results shows that an intense decrease in the level of carbohydrate metabolism is observed mainly in cows of the third kind 5-7 months of lactation.

The level of carbohydrate metabolism dynamically decreases with the age of cows, so the highest level is in cows of the first calving, the lowest level is in the fifth calving, and an intensive decrease is observed in the third calving in 5-7 months of lactation. Under conditions of hay-concentrate feeding, the level of metabolism is always lower than in silage-concentrate feeding. With increasing lactation, the level of carbohydrate metabolism dynamically decreases, which was observed in heifers at 3 and 4 months of pregnancy, in cows of the first calving - at 5.6, the second - at 6, the third - at 6.7, the fourth - at 7, the fifth - at 8 months of lactation. Under conditions of hay-concentrate feeding, the level of carbohydrate metabolism is always lower than in silage-concentrate feeding, which is explained by the lack of energy supply for the cows' body for the growth and development of the fetus, as well as milk production.

In the conditions of the Bukhara region, in cows of the third calving in the silage-concentrate type of feeding, the amount of glucose in the blood in the first month of lactation averaged 1.92 ± 0.02 Mmol/l, which is significantly less than in the Samarkand region (2.02 ± 0.02 Mmol/l) of cows of the same age, and then dynamically decreased until the end of lactation (1.50 ± 0.01 Mmol/l). A strongly reduced level of carbohydrate metabolism was 10% each in the 1st, 2nd, 3rd months of lactation, 20% each in the 4th, 6th, 30% each in the 7th, 8th, 40% each. in the first half of the dry period 30, in the second half - 20%.

In the hay-concentrate type, the dynamics of carbohydrate metabolism were identical to the previous type, and the greatly reduced level was 10, 10, 20, 20, 30, 40, 40, 40, 30, 20%, respectively.

In the conditions of the Kashkadarya region, in cows of the third calving in the silage-concentrate type of feeding, the amount of glucose in the blood in the first month of lactation averaged 1.94 ± 0.02 Mmol/l and dynamically decreased until the end of the lactation period (1.52 ± 0.01 mmol/l). A strongly reduced level of carbohydrate metabolism, although not established in the first month of lactation, was 10, 10, 20, 30, 30, 30 and 40% in the 2, 3, 4, 5, 6, 7 and 8 months, in the first half dry period 20%, in the second half - 10%.

In the hay-concentrate type of feeding, the amount of glucose in the blood in the first month of lactation averaged 1.86 ± 0.01 mmol/l. Its dynamic decrease also continued until the end of the lactation period (1.50 ± 0.01 Mmol/l). A strongly reduced level of carbohydrate metabolism was noted in all months of the lactation (10, 10, 10, 20, 40, 40, 40, 40%, respectively) and dry (40, 30%, respectively) periods.

Consequently, noticeable increases in carbohydrate metabolism disorders in cows in the Bukhara and Kashkadarya regions can be explained not only by increased lactation and increased pregnancy, but

also by the negative influences of extreme soil, climatic and environmental conditions of regions where high salinity prevails in the external environment.

Conclusions.

1. The level of carbohydrate metabolism changes noticeably depending on the age of the cows, which is characterized by an increase until the first calving, and then a dynamic decrease until the fifth calving.
2. The level of carbohydrate metabolism in cows, depending on the periods of lactation and dry wood, is a dynamic decrease in heifers up to 3, 4 months of pregnancy, in cows of the first calving - up to 5, 6 months, second calving - up to 6 months, third calving - up to 6 months, 7 months, fourth calving - up to 7 months, fifth calving - up to 8 months of lactation and a moderate dynamic increase with the approach of calving.
3. The etiological factors for impaired carbohydrate metabolism in cows are considered not only the inadequacy of energy material, but also the extreme soil, climatic and environmental conditions of the region.
4. When conducting medical examinations of cows, it is advisable to take into account the time of manifestation of carbohydrate metabolism disorders, depending on age, lactation periods and type of feeding, as well as soil, climatic and environmental conditions of the region.

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