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MODEL DAIRY COWS IDEAL TYPE

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The paper summarizes the analytical data of many years of research on the mathematical description of growth patterns and relationships "age, body size" of the model heifers and cows, the ideal type. The calculated constants of the linear growth of cows for growth models. It is shown that the possibility of resolving the two growth models for dairy cows.

Selection, model, an ideal type, dairy cow, a constant growth rate, live weight, the law of thermodynamics.

The increasing involvement of mathematics, quantitative description of the instrument indicate that the animal science enters into a mature phase, when they begin to dominate the normal ways of doing research. At the heart of the growth model is algebra, differential and integral calculus, ordinary nonlinear equations. Rostov model is a set of formal relations, which shows the behavior of the system (the body) in time. They belong to the class of dynamic (deterministic), which form the prediction of live weight or sounding as a number, not a probability distribution. The results represent the analysis method, the form of materials for the practice of their use.

The aim of research was to evaluate the possibilities of resolving the two growth models describing the relationship of "age-size of the body." To solve this problem prognosis compared with actual results. In their relations determine the reliability growth model [1,4].

To solve the mathematical problem we used the results of 10 years of observations of a group of heifers and cows Simmental, the descendants of the party animals arrived from Germany. Group size - 12 goals. Measurements

conducted in animals following order: newborns, the 3-, 6-, 9- to 12-, 18-month old, in the 2-, 3-, 4-, 5-, 6-, 7-, 8- , 9-, 10- year-old. Animals were half-sister on the father, Zenith 59, the founder of the line in the rock [1]. The live weight of up to one year of age is determined on a monthly basis, in the second year - once in three months later - every year for 5-6 months of lactation and appraisal [2,3].

Results and discussion. In dairy cattle should be carried out a detailed assessment of the type of animal. Domestic and foreign practice shows that a good body type cows have greater productivity and greater life expectancy. In the US, for example, scientists have proposed the concept of a "typical" and "longevity" equal to each other, because it was found that cows with a long productive life and lifetime high productivity have much in common type. These cows are of good health, strong limbs, excellent fertility, good form of the udder and its tight attachment, rare cases of mastitis, ketosis and paresis after calving. The real significance of body type are often hidden, because always in the forefront are the main features of productivity.

Man in the selection process have always tried to select the best animals, excellent on the exterior, beautiful. It is no coincidence were organized and held an exhibition of animals now - it's a kind of beauty contests that people invented for themselves and for the animals. Approach to the beauty of animals in humans is quite specific and concrete - good. History livestock shows that the concept of "beauty animal" is familiar for a long time.

Breeder creates a perfect animal, using the three principles. First of all, it creates a form useful for people to meet their specific needs. Secondly, it takes care to create the animal was appropriate for a particular habitat. And finally, he creates the laws of beauty. In fact, except for a set of other needs, a person has one singular: the need for beauty. Perfect in form animal demonstrations at trade shows, makes people the same aesthetic sense, what he feels during the inspection of works of art.

Of course, we do not call a beautiful animal just for the form of ears or special colors suit. But if the general form of the animal creates the impression of a

distinct breeds, if all articles are combined with each other - it can not fail to delight. Total harmony does not mean that we should not pay attention to the beauty of individual articles. Far from being a trifle hoof shape, strength, and lustrous hoof horn, shine and softness of hair and even eye color.

In the definition of beauty animal necessarily include the definition of its pedigree. Beautiful animal - is primarily combines all the virtues breed qualities. In each breed should have their standards of beauty, corresponding to the direction of productivity of this breed.

In each breed, herd should be animal models. Their beauty breeds combined with strong constitution, and high productivity. Beautiful animals have to be strong constitution and have high vitality. Consider such a beautiful animal in which the proportionality of the figure, movement, temperament and character meet the general requirements of our aesthetic taste and connect with these qualities and high productivity.

Breed standard of beauty can not be permanent. With the improvement he will change, but the most interesting, record the animals should always be the top rock, to serve as a beacon, a pointer to the path for breeders.

Beauty is known only by eye, and the more experienced breeder, the better he knows the breed as a whole, the better and more valuable is his estimate of an animal. Unsuitable for knowledge and beauty is the most common estimate of the animal on articles. No matter how good was to become each separately, the animal can still be ugly, uncollected, as they say "poorly stitched".

In breeding were offered two growth models to describe the relationship "age-size of the body." The first - in 1927 by Samuel Brody; the second - in 1928, N.V. Naydenov. Both authors - came from the Republic of Belarus. S. Brodie in the early twentieth century emigrated to the United States. In the following years, in biology and animal husbandry, more than other models did not appear. There are many growth models describing the relationship of "age-live weight". The fate of these two models proved to be difficult in domestic zootechnology. Since their appearance, for half a century (1928-78 biennium.) Only once rostovaja model S.

Brodie was used N.N. Kolesnik in 1936 to describe the linear growth Schwyz cattle. 40 years later, in 1976, wanting to simplify the mathematical calculations for livestock interns, Professor N.N. Kolesnik offered special scales for five measurements and live weight, calculated using the growth model of S. Brodie. YES I A.M. Kislovskiy in 1936 included a workshop on breeding nonlinear equations S. Brodie to describe the growth of animals and lactation curve of cows. However, after 1948 mathematization zootechnology was inhibited by 25 years.

In Western Europe and America rostovaja model S. Brodie widely used. Rostov model N.V. Naidenova half a century generally suppressed and has not been studied in universities. Since 1977, both models have become widely used to describe the growth of heifers and cows at the Institute of Animal Breeding and Genetics of the Ukrainian Academy of Agrarian Sciences comparative characteristics but they were first given below. Both methods are united by a common approach - the first law of thermodynamics. The growth curve of mammals has a spatial configuration of the sigmoid. It can be divided into three parts: the phase of progressive growth (youth) - leaving age in dairy-beef breeds 80 months, stable growth phase (maturity) - age 6.5-10 years; regressive phase of growth (age) - after 10 years. After integration of the balance equations underlying the first law of thermodynamics, growth model S. Brodie took the following form:

$$W = A - B * e^{-Kt}$$
$$W = A * (I - e^{-K(t-t1)})$$

Method N.V. Naidenova. At the heart of the growth model is based on the basic equation:

$$\Delta Y/\Delta X = (A - Y) * K$$

As a result of integration, N.V. Naidenov proposed the following the growth model:

$$Y = A * (I - 10^{-Kx}),$$

Legend:

Y-sounding gain during X (from conception in months);

Y-value measurements, see under the age X;

A-assimptota, the value of soundings at the age of 72-80 months, see;

K-constant growth sounding = lg [(AY): A] / X.

In sequential decision basic equations using integral calculus was obtained refined formula growth model. It has the following form:

$$Y = A * (I - e^{-Kx}),$$

$$Y = A * (I - 10^{-MKx}),$$

In particular, put the value of "K" (the base of natural logarithms 2.718282) in the fifth equation or module logarithms (M = 0.4343 ...) in the six equations. Accordingly, simplification of the value of "K" in terms of the "K1":

$$K1 = \ln [(A - Y) : A]/X \quad \text{или}$$

$$K1 = \lg [(A - Y) : A]/X .$$

In quantitative terms, the value of K1 approaches to the characterization of the relative rate of growth for S. Brodie or specific growth rate on II Schmalhausen proposed in 1932. At the same time allowing the possibility of a growth model NV Naidenova not change because "K" = M * K1. Equation S. Brodie greatest difficulty is the determination of the «t1», the amendments to the uneven growth through graphic-analytical method on semi-log paper. In the method, N.V. Naidenova such amendment is not used or is difficulty to use the growth model.

The results of experimental studies have shown that animals live weight: 38 kg newborn; 12 months - 300 kg; 24 months - 510 kg; 84 months - 680 kg.

Analysis of the data shows that both methods have high resolution feature reliable enough. The longest match of actual and estimated data observed from the age of the animals, or closer to the mature size (asymptote). The smallest deviations are observed for such measurements as compared with the measurement of:

Height at the withers - 2.3%;

Height in the sacrum - 3-4%;

The depth of chest - 8.4%;

Chest width - 8.9%;

Chest girth - 2.4%;

Metacarpus - up to 1%.

Both methods are based on the fundamental theoretical basis and accessible mathematical apparatus.

In the method, N.V. Naidenova to characterize the growth of individual articles put the value of P = 100 * K. The growth period is divided into two steps:

From fertilization to 10 months (0.5 months after birth); from 11 to 20 months; from 21 to 30 months; from 31 to 40 months; from 41 to 80 months.

At each stage is determined by the value of "K". For example, an increase in height at withers occur during the embryonic period to 3.54 times faster than the subsequent stage.

The index "100 * K" is also used in the method of Brodie to quantify abnormalities in growth, as well as to compare the growth characteristics of various breeds heifers.

Conclusion. Use of mathematical growth models can describe the age growth curves of individual animals or groups of animals. This in turn makes it possible to estimate the growth rate at different stages postembryogenesis. Actually, make adjustments to the scheme of feeding. In the future, compares with the standards of the American rock types and growth standards for elite groups and established in valuation of standards. Application of the methods in the domestic zootechnology very important and significant.

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