Present proyzvodstvennaya proverka regimes work upravlyayuscheho Zveniv doylnыh apparatov with razlychnыmy modes work. Showing Benefits for byotehnolohycheskym indicators doylnoho apparatus, pairs kombynyrovannoho action compared with the apparatus of existing simultaneous (ADU-1) and pairs (Ynterpuls-90) action.

Doylnыy apparatus, work regimes, odnovremennыy mode poparnыy mode pairs Combined treatment byotehnolohycheskye indicators, molokootdacha cow.

Present production test modes of the control units of milking machines with different operating modes. The advantages for biotechnological parameters milking machine-pairs combined action compared to existing devices simultaneously (ADU-1) and pairs (Interpuls-90) action.

Milking machine modes, simultaneous treatment regime in pairs, pairs combined-mode biotech indices of milk, cow.

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MODE TRANSPORTATION RESEARCH MOLOKOPOVITRYANOYI mixture in the dairy milking machine hose

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The influence of the mode of transportation molokopovitryanoyi blends the quality of milk in the milk hose Milking machine Milk overhead.

Modes of transportation molokopovitryana mix, milk hose, milking machine, top molokoprovod.

Formulation of the problem. The quality of milk depends on many factors: animal health, fodder, housing conditions, health status and hardware specifications. According to statistics produced milk in Ukraine from the population of different ownership Extra Class 6%, higher grade of about 32%, and first grade of about 60%. It follows that the milking equipment has a large impact on the quality of the product. This is especially true not set operational characteristics of milking machines,

which can lead to lower quality milk. Particularly negative impact is manifested during transport molokopovitryanoyi mixture to the milk hose milking machine pulsation phenomenon appears. The fat contained in milk, as a result of shaking peels off the walls and remains of milk. This leads to reduced fat milk and pollution molokoprovidnyh lines. Loss fat milk during transportation by pipeline may be from 0.2 to 0.32% [1].

Another undesirable in molokoprovidnomu hose is dispersion - splitting milk balls in the dust under a strong stream of air, which further leads to zhirknennya milk. This is especially true for milking machines at the top of milk stall dependents as raising molokopovitryanoyi mixture to a height of more than 2m requires appropriate pressure gradient.

Analysis of recent research. Research for top milking machines Milk and milk transport air mixture engaged: AI Fenenko [1] Bazarov MA [2] Lishchynsky SP [3] VV Gerasymchuk [4], O'Callaghan E. J. [5, 6], Dirk Hömberg [7, 8].

Scientists argue that milking must take place at vakuumetrychnomu pressure cycle ssanya 40-42 kPa and a compression stroke about 70-75 kPa, which corresponds to the physiological ssanyu calf. [10] Also, the pressure between these limits will not hurt the cow teat sphincter.

German scientist Dirk Hömberg and Irish O'Callaghan E. J. argue that simultaneous milking of four teats more comfortable for the animals than alternate two teats. This is achieved by pressure fluctuations in cycle ssanya to 60-65 kPa [6, 8]. Simultaneous milking increases the transportation but the problem is not solved because the ripple increases the portion of milk.

In [4] VV Herasymchuk pulsation problem is solved by the construction of a large reservoir volume and Batch intake air through the valve. Milk is transported in a large portion of molokoprovod. This partly solves the problem of ripple, but significantly complicates the design and needs further research.

Scientists Fenenko AI SP Lishchynsky hold to the view that the optimum amount of collector is 150-250 ml [1, 3], the diameter of the hose shall not exceed 14 mm and the air inlet will be permanently. AI Fenenko offers a combination of treatment and simultaneous pairwise milking.

Analysis of existing Milking equipment, and research in this area has shown that the impact of technical indicators milking machines on animal health and the quality of the finished product not sufficiently studied and resolved.

The purpose of research. Justify mode of transportation milk air mixture at the top molokoprovod provided reduce ripple and dispersion phenomena.

Results. Most milking machines operate at constant inlet air 8-10 l / min. Of milk cows average productivity is about 4.6 l / min. Time milking milking machine is 5-6 minutes. Of milk variable over time and varies from 0.2 to 6.8 l / min. Thus the ratio of air and air mixture in milk changes over time, leading to regime change transportation. Generalizing the study argue that the quality of milk, which is under the influence hydro depend on the speed and acceleration of the flow, duration of exposure and changes of direction.

So at the beginning and end of milking when of milk ranges from 0 to 2 l / min. is dispersed mode of movement of the annular passage. At this time, the amount of air is much higher than milk and can reach a ratio of 16: 1 to 32: 1. When of milk from 2 to 4-4.5 liters / min. there is a steady portion mode when the bulk of servings of milk moving between two air plugs. When more of milk reaches 4.5-4.8 l / min. unstable pulsating motion mode.

Number of milk for one rate rise did not have time to molokoprovod flows down, increasing losses in raising the next portion of milk, reducing its speed. So milk is transported air mixture in pulsed mode. Daily flow depends on the concentration of costly air mixture. Ring movement molokopovitryanoyi mixture evident in the two-stroke milking machines sinters with additional air into the milk collecting chamber. Pulsating mode characteristic corky trytaktnyh milking machines with periodic intake air. So some Milking machines Westfalia firms have increased the amount of air. In this mode of transport becomes dispersed in [9].

After experimental studies milking machine can be roughly distinguish the boundaries modes of transportation mokopovitryanoyi mixture in the dairy milking hose at the top molokoprovod (Fig. 1).

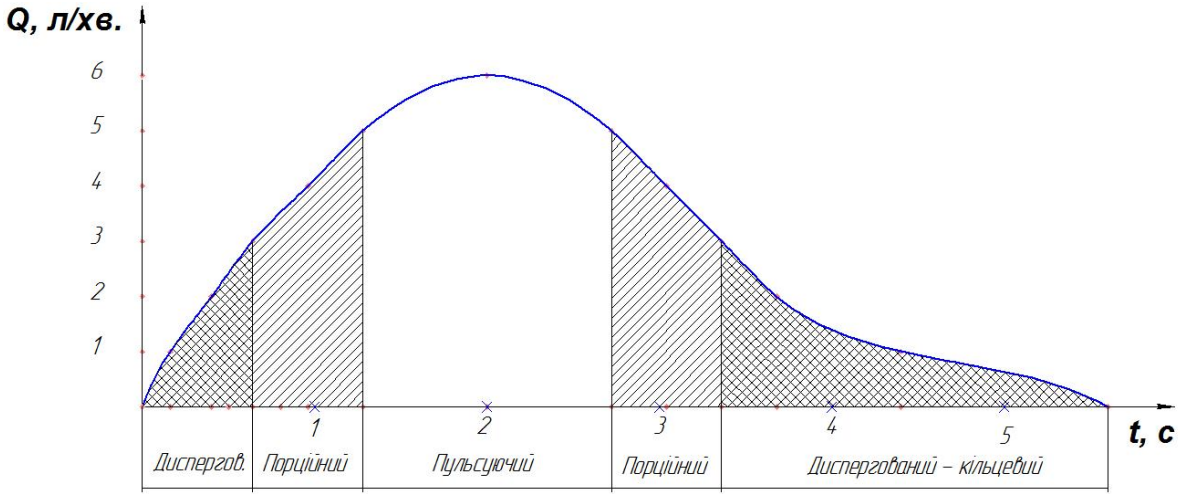

Fig. 1. Modes of transportation molokopovitryanoyi mixture of milk depending on.

After analyzing the research shows that about 20% of milk is transported in pulsed mode. The ratio of air to the amount of milk in this case is in the range from 0.7: 1 to 1: 1. Density molokopovitryanoyi mixture varies mezhah450-600 kg / m3. So it is advisable first usunytu or decrease vzbovtuvannya molokoprovidnoyi mixture in the hose.Ripple on peak of milk may eliminate by increasing the amount of air to 90 l / min., Or reducing milk hose diameter to 0.01 m. But this can lead to a sharp rise in pressure and deterioration of physiological conditions milking. Speed molokopovitryanoyi mix in the milk hose that satisfy the zootechnical conditions should not exceed 2,5-2,8 m / s. These data must comply with the development of new milking machines [1].

All milking machines transportation is by air flow entering the chamber molokozbirnu collector, and creates a pressure difference arises lift, pushing the portion of milk. The difference between the value of the lift and losses on hold portions and friction determines the amount of pressure and flow rate molokopovitryanoyi mixture.

In deriving the milk from the udder of a dairy hose shaped portion molokopovitryanoyi mixture and due to the smaller pressure Milk partially lifted. In the next cell in molokozbirnu collector incoming air speed of 8.10 l / min. at atmospheric pressure and 98-100 kPa. Popadayuchy the camera manifold air mass M loses its pressure and begins to perform work on the expansion and moving portions of milk up.

The law of Boyle-Marriott accept:

$$P_{\text{к}}V_{\text{к}} = V_{\text{т}}(P_{\text{п}} + P_G); \quad (1)$$

where: - the pressure in the reservoir milking machine after the air (or pressure in the reservoir in the compression stroke) kPa; - The volume of air received by collector chamber, m3; - The volume molokoprovidnoho tract (manifold volume and the volume of milk hose) m3 - under pressure portion of milk transported kPa; - The loss of the maintenance portion of milk during transportation, kPa:$P_{\text{к}}$

$$V_{\text{к}}V_{\text{т}}P_{\text{п}}P_G$$

$$P_G = \frac{Q_{\text{П}}\rho_{\text{П}}+Q_{\text{М}}\rho_{\text{М}}}{\pi d^2}\left(4gt + 0{,}811\frac{(Q_{\text{П}}+Q_{\text{М}})}{d^5} - \frac{16(Q_{\text{П}}+Q_{\text{М}})}{\pi d^2}\right), \quad (2)$$

where: $Q_{\text{м}}, Q_{\text{п}}$ - In accordance milk and air, m3 / s; $\rho_{\text{м}}, \rho_{\text{п}}$ - In accordance milk and density of air, kg / m3; - Acceleration of gravity, m / s2.g

Solving expression (1), can be determine elevation portions of milk.

$$P_{\text{к}}V_{\text{к}} = (V_{\text{к}} + \frac{\pi d^2}{4} l_{\text{ш}})(P_{\text{п}} + P_G); \quad (3)$$

$$l_{\text{ш}} = \frac{4\left(\frac{P_{\text{к}}V_{\text{к}}}{P_{\text{п}}+P_G} - V_{\text{к}}\right)}{\pi d^2}. \quad (4)$$

After analyzing the formula (Fig. 2) found that the greatest impact on raising portion with pressure losses on hold portions of milk, the diameter of the hose and manifold pressure in the compression stroke.

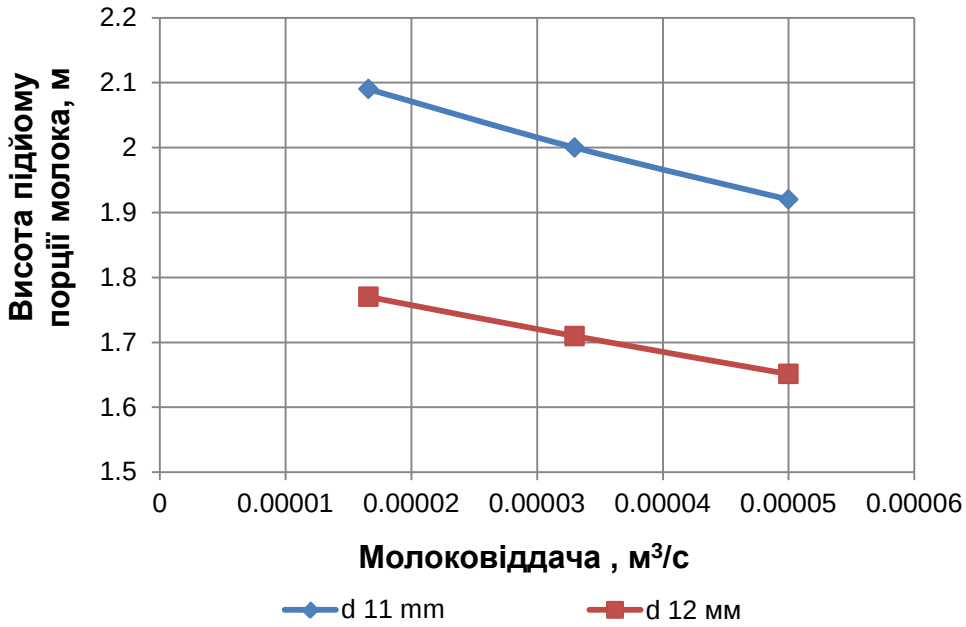

Fig. 2. Dependence of height of lifting molokopovitryanoyi mixture of milk.

So, as an increase in pressure in the reservoir chamber could lead to termination of the nipple sphincter cows, adjust the height of the transportation mix molokopovitryanoyi possible by the diameter of the milk hose.We propose to divide the flow of milk and get two sections collector who work separately. When milking teats with two out portion of milk that forms in the milk hose stream. In the portion of the compression stroke air volume of 4 l / min. performs work on moving this portion milk in molokoprovod.

The problem is solved by creating a reservoir where milk air mixture is transported by two smaller diameter hoses[11]. Molokozbirna collector chamber is divided into two parts. Each part has its molokovidvidnyy pipe and removes milk separately, such as front and rear udder cow fractions. In the distribution manifold chamber has two openings calibrated separately for each part. Sinters air is in pairs according to the operation mode pulsator.

Created collector milking machine pairs action provides the ability to transport milk in standby cycles of compression and flow of milk in molokozbirnu camera collector mode cycles sucking. This mode provides transportation fractions derived from milk in the udder molokoprovod without pulsation flow. Milk transported in batch mode and 10-15% reduced vzbovtuvannya.

Conclusion. Benefits of the proposed designs are in a superior mode of transportation of milk by creating additional pressure gradient in the compression stroke alternately in two glasses. Thus eliminated the

accompanying flow pulsation milk fat particle dispersion and therefore a deterioration of its quality

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Opredeleno regimes transportyrovky Effect on Quality molokovozdushnoy mixture of milk in the milk hose doylnoho apparatus with top Milk.

Transportyrovky regimes, molokovozdushnaya Mixture, molochnыy hose doylnыy apparatus, the upper Milk.

The influence of modes of transportation milk air mixture on quality of milk in milk pipe milking machine with overhead milk line.

Modes of transportation, milk air mixture, milk hose, milking apparatus, overhead milk line.