

R. Stavetska, N. Klopenko. Udder morphological characteristics of Ukrainian Black-and-White Dairy breed under absorbing crossbreeding

The aim of the research was to study morphological characteristics of udder, polymastia and polythelia frequency of Ukrainian Black-and-White Dairy first-calf heifers under absorbing crossbreeding and detection of correlation between milk yield per day and morphological characteristics of cows' udder.

The study was conducted in the herds of Ukrainian Black-and-White Dairy breed in the breeding farms «Suholiske» LLC, AF «Matiushi» LLC and AF «Glushky» LLC, Bila Tserkva district, Kyiv region. To conduct analytical studies based on part of Holstein inheritance researched livestock were divided into three groups: 75,0–87,4 % 87,5–99,9 % and 100 %.

According to the results of the own research it was found, that under absorbing crossbreeding and increasing of part of Holstein inheritance morphological characteristics of udder of cows in the researched herds have been improved. The highest level of most udder measurements and indexes had first-calf heifers with part of Holstein inheritance 100 %.

On average, in the researched herds, cows with part of Holstein inheritance 100 % had the advantage in udder length by 1,4 cm, width – 0,6 cm, depth – 0,4 cm, girth – 1,2 cm, in the distance from the udder bottom to the floor – 0,3 cm, teat length – 0,3 cm, teat diameter – 0,12 cm compared with cows, which had part of Holstein inheritance 87,5–99,9 %, but the difference in performance was unreliable. The advantage over udder measurements of cows with part of Holstein inheritance 75,0–87,4 % in udder length was 3,2 cm, width – 1,7 cm, depth – 1,4 cm, girth – 6,0 cm, distance from the udder bottom to the floor – 1,0 cm, teat length – 0,3 cm, teat diameter – 0,18 cm.

In the herd of AF «Glushky» LLC, cows with part of Holstein inheritance 100 % weren't significantly inferior in udder format index (by 0,1 %) and had the advantage in relative value udder index (by 5,9 %), relative size udder index (by 2,3 %, $P < 0,001$) and conditional udder value index (by 214 conditional units) compared with analogical characteristics of cows with part of Holstein inheritance 75,0–87,4 %.

In the herd of AF «Matiushi» LLC, cows with part of Holstein inheritance 100 % were characterized by typical reducing of udder format index (by 0,5 %) and the advantage in form index (by 0,08), relative value udder index (by 8,2 %), relative size udder index (by 2,3 %) and conditional udder value index (by 262 conditional units, $P < 0,01$) compared with the udder indexes of cows with part of Holstein inheritance 75,0–87,4 %. Advantage in value of udder indexes of cows with Holstein inheritance 100 % compared with cows with part of Holstein inheritance 87,5–99,9 % was: in form index – 0,06, relative value udder index – 4,3 %, relative size udder index – 1,4 % and conditional udder value index – 56 conditional units.

In the herd of «Suholiske» LLC, cows with part of Holstein inheritance 100 % also had lower performance of udder format index (by 0,5 %) and dominated by

form index – 0,07, relative value udder index (6,4 %, $P < 0,05$), relative size udder index (1,9 %, $P < 0,05$) and conditional udder value index (by 308 conventional units) compared with same indexes of cows with part of Holstein inheritance 75,0–87,4 %.

Therefore, absorbing crossbreeding and increasing of part of Holstein inheritance were accompanied with increasing of udder length, width, depth and girth as well as a gradual increasing of udder indexes at first-calf heifers.

In the own research, differences were found in the direction, strength and probability of correlations between milk yield and morphological characteristics of first-calf heifers' udder. In most cases, the correlations between milk yield and udder measurements were positive and weak in strength.

Cows with part of Holstein inheritance 75,0–87,4 % had strong positive probable correlations between milk yield per day and udder length ($r = + 0,68$, $P < 0,05$), milk yield per day and teat length ($r = + 0,64$, $P < 0,05$). Cows with part of Holstein inheritance 87,5–99,9 % had moderate in strength probable correlation between milk yield per day and udder length ($r = + 0,45$, $P < 0,001$). It should be noted that in this group of cows, correlations between milk yield per day and udder morphological characteristics had high probability ($P < 0,001$) in all cases. Cows with part of Holstein inheritance 100 % had these correlations different in direction. Weak positive probable correlation between milk yield per day and udder length ($r = + 0,14$, $P < 0,01$), moderate in strength, negative correlation – between milk yield per day and teat length ($r = - 0,06$, $P < 0,05$) and moderate in strength, probable correlation between milk yield per day and distance from the udder bottom to the floor ($r = - 0,35$, $P < 0,001$) were found.

It was found, that absorbing crossbreeding led to decreasing of the frequency of extra teats in cows. The less frequency of extra teats had cows with part of Holstein inheritance 100 %.

In the breeding farm AF «Glushky» LLC, the frequency of cows with extra teats under increasing of part of Holstein inheritance from 75,0–87,4 % to 100 % declined from 9,0 to 6,9 %, in AF «Matiushi» LLC – from 16,0 to 5,7 %, in «Suholiske» LLC – from 14,6 to 8,3 %, on average in these herds – from 11,8 to 6,7 %. This is an evidence of positive impact of Holstein breed on extra teats frequency and udder improvement of Ukrainian Black-and-White Dairy cows.

In the frequency of udder parts atrophy there was observed the opposite trend: under absorbing crossbreeding the frequency of cows with udder parts atrophy had increased.

Keywords: Ukrainian Black-and-White Dairy breed, absorbing crossbreeding, udder measurements, udder indexes, milk yield per day, polymastia and polythelia