THE EVALUATION OF RED FACTOR CARRYING HOLSTEIN BULLS IN THE IMPROVEMENT OF RED HOLSTEIN-FRIESIAN STOCKS IN HUNGARY

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HUNGARY

Hungary has the largest Holstein stock (about 30.000 female individuals) in Europe. Within 20 years the Holstein-type cattle stock will be increased about up to 600 thousand females (mostly Black-and-White coloured animals) by using upgrading breeding program to improve dairy production of the Hungarian Simmental base population. Also in some other countries in Europe (for example in Switzerland, Austria, Bavaria, Czechoslovakia, the Soviet Union) there exists great interest not only for Black-and-White, but also for Red-and-White coloured Holstein bulls in order to improve local cattle breeds by cross-breeding. According to gene-frequency investigations (Sebestyén, 1980) about 10 % of the Hungarian Holstein population carry the red factor as "Carrier" (heterozygous individuals). Besides that stock there are a small Red-and-White nucleus herd and a large number of cross-bred cows of Red-and-White type at the time being in Hungary.

Because of the great importance of the international integration of the breeding work in the field of cattle production, it may be international interest to evaluate the progeny testing results of high-quality US-Holstein bulls.

We have investigated the progeny test results of US-Holstein bulls reported by the World-Wide Sires Inc. in the recent 4 years. The progeny test results have been summarized according to colour type and year (see Table 1).

From international point of view the top sires are of greatest interest, therefore the distribution of their improving effect is also tabulated (see Table 2).

Table 1

Progeny testing results of Black-and-White, Red-and-White and "Carrier" Holstein-Friesian bulls tested in the USA (Sources: World-Wide Sires, Inc. USA, 1979, 1980, 1981, 1982)

Parameters	Black-and-White	Red-and-White	"Carrier"
Year: 1979			
No. of bulls	90	4	-
Av. No. progenies	633	30	-
Rep. %	75	51	-
Milk kg	7539	7024	-
Fat kg	276	257	-
Fat %	3,67	3,66	-
IMPROVING EFFECT			
Milk kg	436	24	-
Fat kg	14	-1	-
Fat %	-0,03	-0,03	-
DOLLAR	88	-0,5	-
Year: 1980			
No. of bulls	121	5	10
Av. No. progenies	503	41	490
Rep. %	72	58	81
Milk kg	7716	7690	7466
Fat kg	283	273	270
Fat %	3,67	3,56	3,62
IMPROVING EFFECT			
Milk kg	471	296	362
Fat kg	15	5	8
Fat %	-0,02	-0,08	-0,07
DOLLAR	108	53	70
Year: 1981			
No. of bulls	90	2	12
Av. No. progenies	736	23	230
Rep. %	74	53	75
Milk kg	7849	7878	7762
Fat kg	287	283	282
Fat %	3,66	3,60	3,64
IMPROVING EFFECT			
Milk kg	503	289	465
Fat kg	17	7	14
Fat %	-0,02	-0,04	-0,04
DOLLAR	125	65	110
Year: 1982			
No. of bulls	84	4	12
Av. No. progenies	692	38	330
Rep. %	77	67	84
Milk kg	8045	7563	7692
Fat kg	292	269	276
Fat %	3,63	3,60	3,60
IMPROVING EFFECT			
Milk kg	561	160	499
Fat kg	18	6	14
Fat %	-0,02	-0,04	-0,06
DOLLAR	149	34	124

Results and conclusions

According to the data involved in Table 1 the following statements can be made:

- The repeatability of the progeny test results is relatively high and practically equal in the Black-and-White and the "Carrier" group. The repeatability of the Red-and-White group is somewhat lower and does not reach 70 %, the desirable lowest level.
- The milk and butterfat production in the Black-and-White and "Carrier" group is high (expressed in mature equivalent) and nearly the same. Concerning the Red-and-White group, the milk and butterfat quantity is somewhat lower and it must be mentioned that the number of tested bulls in this group is very small.
- As far as the improving effect is concerned, the rank order of the groups is as follows: 1. Black-and-White, 2. "Carrier", 3. Red-and-White.

From Table 2 the following conclusions can be drawn:

- The pattern of the distribution of improving effect shows a positive trend.
- The differences between ranges are great in the Black-and-White and "Carrier" group. It is worthwhile to mention that the evaluated population reprezents a top category of progeny tested bull stock.
- An improving effect over 800 kg milk has been reached by 22 Black-and-White and 2 "Carriers" bulls only!

On the basis of the results presented it can be outlined that

- in case of mating "Carrier" cows (which must be monitored concerning heterozygosity!) with top "Carrier" bulls, the average milk production can be increased about up to the same level as by using Black-and-White top sires, having the possibility to produce 25 % Red-and-White progenies

- when mating with Red-and-White sires in general a relatively moderated level of milk production can be counted with. Using "Carrier" cows as mating partners, in this case the rate of Red-and-White offsprings amounts to 50 %.

- The interested breeders must be prepared that by mating with top "Carrier" or Red-and-White sires, the genetic variance of the population over a long time interval will be reduced, simultaneously the genetic progress should be hindered.

SUMMARY

Hungary has the largest Holstein stock in Europe (cca. 30 thousand females) and is developing a great Holstein-type population by upgrading breeding method. The latest progeny testing results of Black-and-White, Red-and-White and "Carrier" US-Holstein bulls have been evaluated. Data are summarized in tables. From the main results presented the following conclusions can be drawn: the top "Carrier" bulls result practically the nearly equal milk production level and improving effect as the best Black-and-White sires. By using Red-and-White sires only a moderated improving effect can be counted with. The breeders must be prepared that by mating with "Carrier" and Red-and-White bulls the genetic variance of the population - over a long time interval - will be reduced, simultaneously the gene-

Table 2

Distribution of Black-and-White, Red-and-White and "Carrier" Holstein-Friesian bulls according to their improving effect (milk kg)

Improving effect (milk kg)	Black-and-White				Red-and-White				"Carrier"		
	1979	1980	1981	1982	1979	1980	1981	1982	1980	1981	1982
- 400 — - 201					1						
- 200 — 0											
0 — + 200	8	4	4	2	2	2	1	3	1	1	
+ 201 — + 400	34	38	25	15	1	1		1	6	3	3
+ 401 — + 600	33	53	38	35		2	1		2	6	6
+ 601 — + 800	12	22	18	22					1	1	2
+ 801 — +1000	3	4	4	7						1	1
above +1000			1	3							

tic progress would be hindered. At the same time it has also been pointed out the genetic possibility for producing Red-and-White offsprings by planned matings which is of interest from international point of view.

R E S U M E N

Hungría tiene la más elevada población Holstein en Europa (unas 30.000 hembras) y está en desarrollo una gran población del tipo Holstein por cruce de absorción. Los últimos resultados de la prueba de sementales en toros Berrendo en Negro, Berrendo en Colorado y "Carrier" US-Holstein/se han evaluado resumiendose los datos en tablas. Entre los principales resultados obtenidos pueden deducirse las siguientes conclusiones: los toros de mayor categoría "Carrier" originan prácticamente una cantidad de leche poco más o menos igual, siendo por ello idéntica su capacidad mejoradora sobre el Berrendo en Negro. La utilización de Berrendos en Colorado sólo ha producido un moderado efecto de mejora. Los ganaderos deben estar preparados a que cruzando con "Carrier" y Berrendo en Negro la varianza genética de la población, durante un largo periodo de tiempo será reducida, simultáneamente el progreso genético no será muy acusado. Al mismo tiempo, se ha señalado tambien que la posibilidad genética para producir descendencia de toros Berrendo en Negro a través de una plan ificación de cruces es de interés desde un punto de vista internacional.