

**CORRELATED EFFECTS OF SELECTION FOR RATE-OF-GAIN  
IN DAIRY CATTLE**

**Correlación entre los efectos de la selección de la ganancia  
en peso en vacuno lechero**

**Corrélation entre les effets de la sélection du gain du poids chez  
le bétail laitier**

M. SOLLER \*  
R. BAR-ANAN \*\*

The increasing importance of the dairy herd as a source of beef has led to the initiation of breeding programs aimed at increasing rate-of-gain in dairy cattle. The overall economic value of such programs, however, will depend to a large extent on the effect of selection for rate of gain on other traits of economic importance. In Israel, A.I. sires are routinely progeny-tested for rate-of-gain as measured by the liveweight-for-age (435 days) of their bull calf offspring (LFA). Table 1 shows phenotypic correlations between the progeny tests of Israeli-Friesian dairy sires for bull calf LFA and various production characteristics of their daughters. Such correlations are usually underestimates of the corresponding genetic correlations. Nevertheless, they do provide some preliminary notions as to the ways in which selection for rate-of-gain may affect other production characteristics in these cattle.

Progeny tests for LFA were based on a minimum of 25 offspring per sire. For many of the sires in the study much larger number of offspring were available. Minimum number of offspring per sire for the other traits are shown in Table 1.

Examination of the correlations in Table 1 gives the following picture of possible correlated effects of selection for increased LFA. There will be an increase in the rate-of-gain of heifers and in the size of mature cows. The larger heifers, however, will not be ready for breeding at an earlier age. On the contrary, they may even be somewhat later maturing than at present. Fat corrected milk production (FCM) in heifers and mature cows will be unaffected, but in heifers,

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\* Department of Genetics, The Hebrew University, Jerusalem, Israel.

\*\* Department of Animal Husbandry, Ministry of Agriculture, P. O. Box 7054, Hakiryá, 61070, Tel Aviv, Israel.

TAB. 1

Trait	Number of sires	Minimum number of daughters	Correlation *
Heifers, rate of gain	27	10	0.67
Mature cows, liveweight	20	10	0.76
Maturity index, heifers	52	50	-0.33
Days open, heifers	60	50	0.06
Days dry, heifers	60	50	0.37
Difficult calving:			
Heifer mates	87	100	0.31
Heifer daughters	94	100	0.01
Cow mates	138	100	0.13
Cow daughters	104	100	-0.31
Calf mortality:			
Heifer mates	87	100	0.21
Heifer daughters	94	100	-0.05
Cow mates	138	100	0.17
Cow daughters	104	100	-0.10
Milk production (FCM):			
1st lactation	142	50	-0.01
2nd lactation	119	50	0.05
Wastage:			
During 1st lactation	94	50	0.18
During 2nd lactation	104	50	0.16

\* Correlation coefficients greater than 0.25 are significant at the 5% level.

at least, there may be an increase in breeding difficulties expressed as an increase in days dry. Again, among heifers there may also be an increase in difficult calvings and in calf mortality. Among mature cows, in contrast, the incidence of calving difficulties may decrease, while the incidence of calf mortality remains the same.

### SUMMARY

Examination of phenotypic correlations between progeny tests of Israeli-Friesian dairy sires for rate of gain of their bull calves, and various production characteristics of their daughters, give the following picture of table 1 of correlated effects of selection for increased rate of gain: In mature cows—increased liveweight and decreased calving difficulties. In heifers—increased growth rate and an increase in difficult calvings and calf mortality; possibly some delay in maturity and some increase in days dry.

### RESUMEN

El examen de las correlaciones fenotípicas en las pruebas de descendencia de toros de raza lechera israelí-frisonas para la ganancia en peso de sus terneros machos, y en diversas características de producción de sus hijas, dieron el cuadro

de efectos de la tabla 1, correlacionados en la selección para el aumento en el tipo de ganancia en peso: en vacas adultas, aumento del peso vivo y disminución de las dificultades de parto; en novillas, aumento del ritmo de crecimiento y aumento en las dificultades del parto, así como mayor mortalidad de los terneros; posiblemente algún retraso en la madurez y algún incremento en los días de reposo de la mama.

#### RESUME

L'étude des corrélations phénotypiques dans les épreuves de descendance des taureaux de race laitière israélienne-frisone pour le gain du poids des veaux mâles, et dans des divers traits de production des filles, ont donné le cadre (table 1) d'effets corrélationnés de sélection pour le gain du poids: chez les vaches matures — augmentation du poids vif et diminution des difficultés d'accouchement. Chez les génisses — augmentation du rythme de croissance et des difficultés d'accouchement; possiblement, quelque retard dans la maturité et quelconque augmentation des jours de sécheresse du pis.

