

SELECTION RESPONSE AND THE PERFORMANCE CROSSBRED PROGENY FROM NORMAL AND DWARF BROILERS BREEDER DAMS

Respuesta selectiva y rendimiento de la descendencia cruzada de madres para broilers normales y enanas

Réponse de sélection et performance de la descendance croisée de reproductrices mères de broilers normales et naines

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The response to two generations of selection to increase eight-week body weight was observed in normal bodied (*AAG*) and in dwarf-bodied (*D2*) broiler-breeder population. Strain *AAG* originated from crossing strain *A* and strain *AG* (DEV *et al.*, 1969). Population *D2* was closely related to *AAG* strain. One sub-line (*B*) in each population was selected for superior eight-week body weight and other sub-line was selected for superior body weight of prospective sires and superior egg weight of dams.

Intra-population progeny of selected *B* and *EW* normal bodied parents did not differ significantly in eight-week body weight after twogenerations of selection. However, eight-week body weight of the dwarf *B* line progeny was significantly ($P < 0.01$) superior to that of the dwarf *EW* line.

The regression analyses indicated that sex-linked genetic variance might be important in the inheritance of eight-week body weight of both normal line progeny. Additive genetic variance was important in *D2B* and the maternal effect in *D2EW* dwarf line. Heritability estimates for eight-week body weight from full-sib variance components were higher for the dwarf (0.39 ± 0.05) than the normal (0.27 ± 0.05) populations.

Egg weight increased more in the *EW* than dwarf *D2EW* line. The egg weight estimated from day-old chickweight were 53.4, 60.9, 56.9 and 58.4 grams for the *B*, *EW*, *D2B* and *D2EW* lines, respectively. Heritability estimates for egg weight, age at first egg and thirty-week body were similar in normal and dwarf populations.

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In spite of a statistically significant genetic correlation between eight-week body weight and age at first egg for *D2EW* (0.74 ± 0.22), sexual maturity of dwarf pullets preceded by 2.6 days ($P < 0.05$) that of the normal *EW*. Apparently sexual maturity of the dwarf pullets was not delayed as effectively by the alternate-day feed restriction schedule as it was in the normal pullets.

Approximately 35 commercial broiler sires were used to inseminate 35 to 40 selected dams in each of the four lines to produce crossbred progeny. An additional 70 dams from another dwarf population (*D1*) were included with the crossbred progeny test the number of progeny of each sex within each cross line varied from 132 to 232 hatched in two hatches from all eggs laid during a four-week production period.

Eight-week body weight of crossbred sons from *EW* line was statistically superior ($P < 0.05$) and daughters slightly superior to that of progeny from *B*. The heterozygous, $dw^+ dw$, sons from *D2B* dams were superior and hemizygous, dw^+ , daughters statistically superior ($P < 0.05$) to the crossbred normal progeny from the *EW* dwarf dams.

Crossbred progeny from *D1* dams were smaller (123) grams at eight-week of age than those from *D2* dwarf dams. Additional heterotic effects expected in *D1* crossbred were not sufficient to overcome the inferiority (148 grams) of the pure *D1* populations.

TABLE 1
LEAST SQUARE MEANS FOR EIGHT-WEEK BODY WEIGHT (GMS) OF CROSSBRED PROGENY FROM
NORMAL AND DWARF DAMS

Mating type	Male	Female
Normal sire \times Normal dams $dw^+ dw^+ \times dw^+$		
B dams	2000 \pm 14.8 ^a	1639 \pm 11.1 ^{ab}
<i>EW</i> dams	2064 \pm 13.8 ^b	1653 \pm 9.0 ^a
Normal sire \times Dwarf dams $dw dw \times dw$		
<i>D2B</i> dams	1933 \pm 12.8 ^c	1609 \pm 8.3 ^b
<i>D2EW</i> dams	1001 \pm 12.8 ^c	1566 \pm 9.1 ^c
<i>D1</i> dams	1782 \pm 13.4 ^d	1476 \pm 8.9 ^d

Mean statistically significant ($P < 0.05$) by DUNCAN'S Multiple range test. Mean followed by a letter «a» is significantly different from those means not having «a» and etc.

The heterozygous, $dw^+ dw$, sons from *D2B* dwarf line were 3.9% and hemizygous, dw^+ , daughters were 1.8% less in eight week body weight than the homozygous, $dw^+ dw^+$, sons and dw^+ , daughters from its counter part *B* line dams. The differences in eight-week body weight of crossbred chicks from the *EW* normal and *D2EW* dwarf line was 7.9% for males and 5.2% for female progeny.

Egg weight of the dwarf *B* line pullets was about 3.5 grams greater than that of the normal *B* line pullets, yet eight-week body weight of crossbred progeny

from these dwarf dams was slightly below that from the normal dams, statistically significant only in sons. Eight-week body weight of crossbred progeny from the two normal line dams was greater than that from the dwarf line dams, but statistically significant only from the *EW* dwarf dams.

SUMMARY

From the results of this study it appears that dwarf dams from *D2B* line selected on the basis of superior eight-week body weight of both the sexes might be a better dwarf broiler breeder pullet for production of crossbred commercial broiler chicks than *D2EW* dwarf broiler breeder dams, where females were selected on the basis of their egg weight and males on their body weight.

RESUMEN

De los resultados de este trabajo se puede deducir que las hembras enanas obtenidas de la línea *D2B* seleccionada sobre la base de un superior peso corporal (en ocho semanas) puede ser una mejor productora de *broilers* en la obtención de cruces comerciales de pollitas que la línea *D2EW*, productora también de hembras enanas *broilers*, cuando son seleccionadas sobre el criterio del peso del huevo, las hembras, y del peso corporal, los machos.

RESUME

En vue de cet travail, nous pouvons considérer que les femelles naines obtenues de la ligne *D2B* sélectionnée sur la caractéristique d'un supérieur poids corporelle (dans huit semaines), peuvent être meilleurs productrices des *broilers* pour l'obtention de différents croisements commerciaux des poulettes *broilers* que la ligne *D2EW*, productrice aussi des femelles *broilers* naines, quand elles ont été sélectionnées sur la base des poids d'oeufs et les mâles sur le poids corporelle.

