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Title of Thesis: A Model for Marker-Assisted Selection for Fast Growth in Native Egyptian Chickens

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Abstract :

The objective of this study was to use the data of growth patterns of local chickens accompanied with their molecular data to develop a strategy for marker-assisted selection for growth. Four lines were used and have been derived from a naturally heat resistant local breed in Egypt. They were a homozygous normally-feathered selected line (CE1), homozygous naked-neck selected line (CE3) and their corresponding control lines (CE2 and CE4). Lines CE1 and CE3 have been selected for high 6-wk BW for five generations. Three generations were obtained for this study. Lines CE1 and CE3 were significantly heavier at 6 weeks of age than their corresponding control lines CE2 and CE4 by 24.15 and 27.07% in the base generation and by 51.4 and 34.5% in the second selected generation. The differences reached to 57.1 and 62.8% at 18 weeks of age in the base generation and 49.3 and 28.7% in the second selected generation. Line CE1 was significantly heavier than line CE3 throughout the growing period. The total number of alleles per locus averaged 7.78 alleles. Polymorphism percentage averaged 50.1 and 55.1% in lines CE1 and CE3 versus 38.6 and 49.6% in lines CE2 and CE4. Percentage of unique alleles averaged 4.3 and 4.6% in lines CE1 and CE3. Many polymorphic allelic bands were differed in their frequencies between high and low performed families in lines CE1 and CE3. A total of 34 polymorphic alleles in 19 loci were flown over generations and the flow trends were different in different lines and families within lines. Principle component analysis was applied to the data of both lines and two main components were found and three canonical correlations were obtained. Four and five bands were persistently concomitant with the highly performed families in lines CE1 and CE3, respectively. These bands would have brought 6-wk BW into higher levels of performance by 25.1 and 16.6% in the second generation if they would have been considered in the selection for 6-wk BW.

Keywords:

Growth; Local chickens; Marker-assisted selection; Microsatellite markers.