

ESTIMATION OF GENETIC VARIABILITY AND BREEDING VALUES, THE EFFECT OF SUBSTITUTION OF ALLELES AND THE AVERAGE EFFECT OF CAST GENE IN SOME CHARACTERISTICS OF GOAT CARCASSES

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ABSTRACT : The study was conducted on 93 Local goat males to determine the breeding values and the additive and dominant effects and Average effect of *CAST* gene substitution in the variation of the slaughter (SLW) and hot (HOT) weights of the carcasses and the rib eye area (REA) using the SNP information by the RFLP and the *MspI* Restriction enzymes. The breeding values (BV) of the MM genotype were higher than those of the MN for SLW and REA of the carcass which were 0.766 and 0.186 respectively, while it was higher for MN genotype(5.962) in HOT trait .Thus strengthening the selection trend on the basis of MM genotype to raise the average weight of carcasses . Also, the dominant variation within the genetic variance was higher than the additive variance, reaching 10.598 and 0.599 for SLW and REA traits respectively indicating the strength of the initial reaction and its effect on the average characteristics. The average of the allele effect and the effect of substitution of alleles were all in favor of the M alleles compare to mutant allele (N), which encourages the selection against the mutant allele.

Key words : Breeding value, genetic variance, alleles substitute, calpastatin gene.

INTRODUCTION

The Calpastatin gene (*CAST*) affects muscle growth and its post-slaughter pattern significantly and it is a gene located on the goat's fifth chromosome (1), a major inhibitor of calpain enzyme post-slaughter activity that regulates the ratio and extent of meat tenderness after slaughter (2). Genetic improvement using selection by genetic markers and genome information is primarily based on the additive effect, which plays an important role in influencing the physiology and evolution of farm animals (3). As that, the dominant effect has added value to the additive variation in the studied character variation, so many studies have begun to shed Highlight this effect (of the dominant variation) role in the total variation of complex productivity traits (4, 5, 6). In order to understand the genetic content and genetic characteristics of the population/herd, a genetic analysis of the variation components, particularly the additive (VA), which represents the breeding value and dominance deviation (VD) and Interaction Deviation (VI) must be done (7). Although the study of genetic maps has largely focused on additive genetic variation, many studies have stressed the importance of non-negligible contribution of non-

additive effects in QTL (8). The different aspects of the different genotypes are mainly due to the pure or hybrid image of the alleles, in another meaning, the amount of the contribution of each allele negatively or positively in the phenotype of the character and the genetic selection in general, but the redistribution of the proportions of these alleles among individuals in order to increase replication at the level of the individual or herd,therefor, its consider an attempt to replace the unwanted allele with another one in the same locus has the most effect, known as the effect of substitution of alleles (7). Live weight is a measure and approximation of the weight in which animals are slaughtered to reach a certain fat level by which animal or carcass value can be predicted for commercial purposes, also the weight of the carcass is an indicator and a key criterion for determining the market class of meat and determining differences in carcass components and components of carcass cuts (9). The researchers pointed out that live weight, hot and cold carcass weights reflect the weights and percentages of different tissues in the carcass, muscle size, weights and percentages of carcass cuts (10, 11). Estimate of rib eye area is an indicator of the amount of muscling in carcass because it is directly