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THE EFFECT OF GENOTYPE AND KEEPING TECHNOLOGY ON THE TEXTURAL ATTRIBUTES OF CHICKEN MEAT

AIMS

In the past decades, demand for high quality poultry meat produced by environmentally friendly production technologies increased in the developed countries. On the basis of this need, alternative poultry breeding technologies (free range and organic) have been developed. The alternative keeping systems and the almost double breeding period may obviously affect the texture quality of poultry meat (compared with intensive rearing) but the parameters of meat quality have not yet been investigated. These properties, however, could play important quality attributes for customers' acceptance. The aim of this study was to characterize the textural attributes of chicken breast meat related to genotypes and keeping technologies.

MATERIALS AND METHODS

The experiment consisted of 7 genotypes, such as pure bred chickens, Hungarian Yellow pullets crossed with S 77, Foxy Chick, Redbro, Hubbard Flex and Shaver Farm meat-type cocks and Ross 308 commercial broiler chickens. Cross-bred hybrids and Hungarian Yellow chickens were reared under free-range conditions for 84 days and Ross 308 chickens were industrially bred for 42 days. Chickens were killed and breast meats were dissected from the carcasses. The skin was removed and the muscles were trimmed of the obvious fat and connective tissue. Samples from each bird were stored at 4C° until analyzed within 24 hours. The textural characteristics of the breast samples were examined using Stevens QTS 25 penetrometer at the laboratory of University of Szeged, Collage of Food Industry, Department of Food Science . The measurements were carried out on the breast samples on three locations each, using the non-destructive TPA method. From the data given by the machine the hardness, gumminess and chewiness values of the breast meat were determined.

RESULTS

The hardness, gumminess and chewiness value of breast meat was higher for free-range chicken than for the broilers fattened in an intensive way. For free-range end products the hardness value measured was 865.5 grams for Ross 308 chicken it was 209.3 grams (*Figure 1*). The gumminess and chewiness values were in the same order 353.4 and 151.8 grams (*Figure 2*), and 1154.7 and 476.7 units (*Figure 3*). For all three parameters the influence of genotype and keeping technology could statistically be proven.

Figure 1

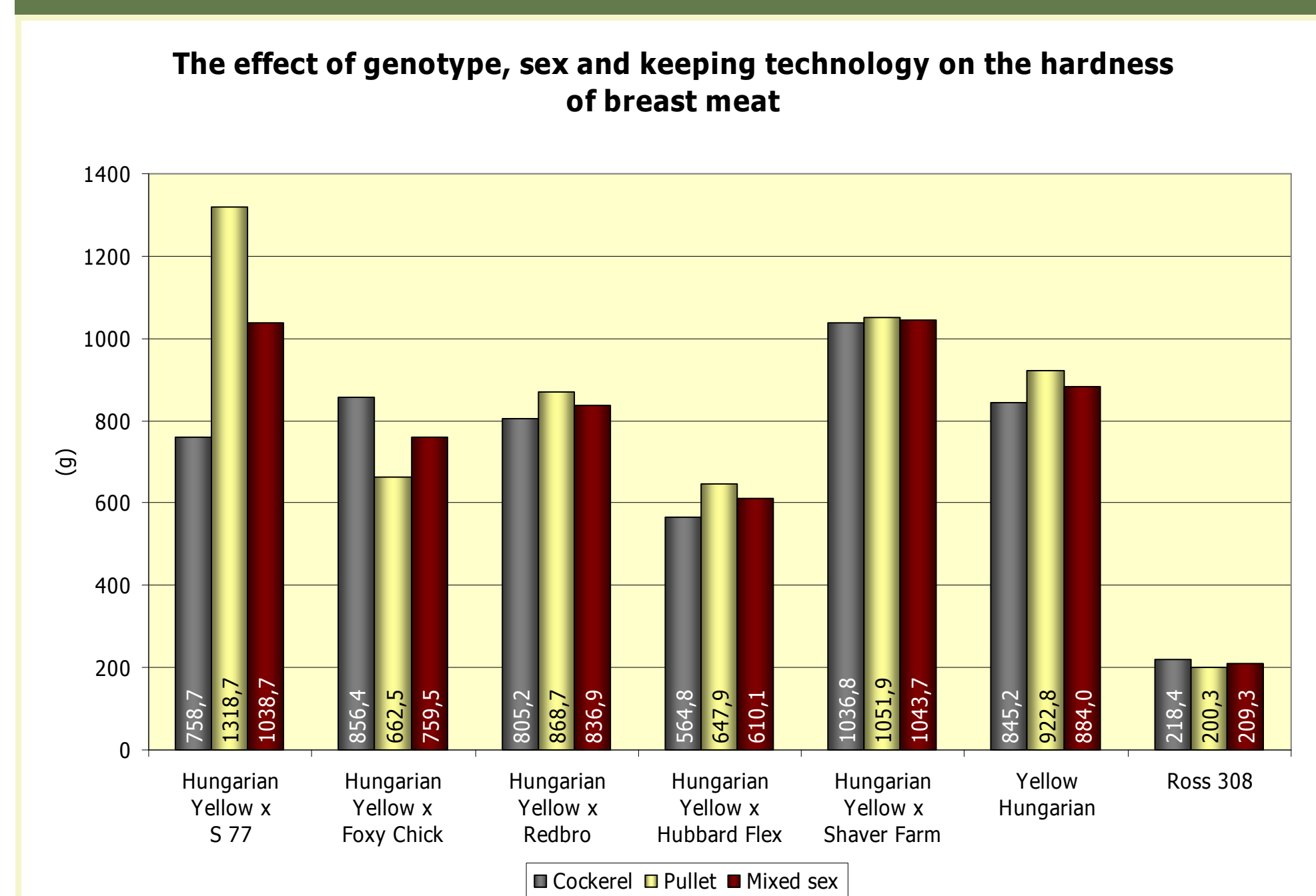


Figure 2

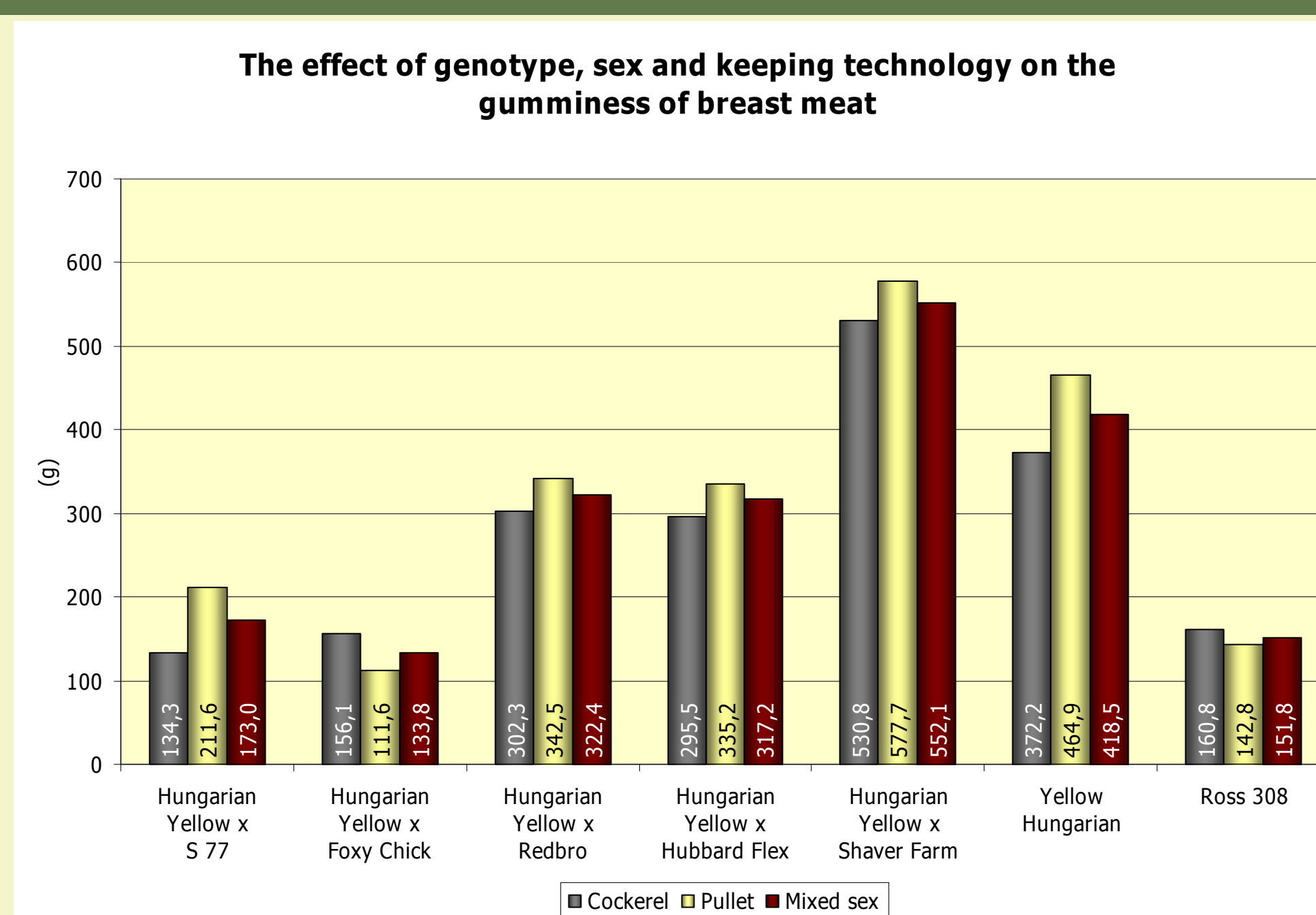
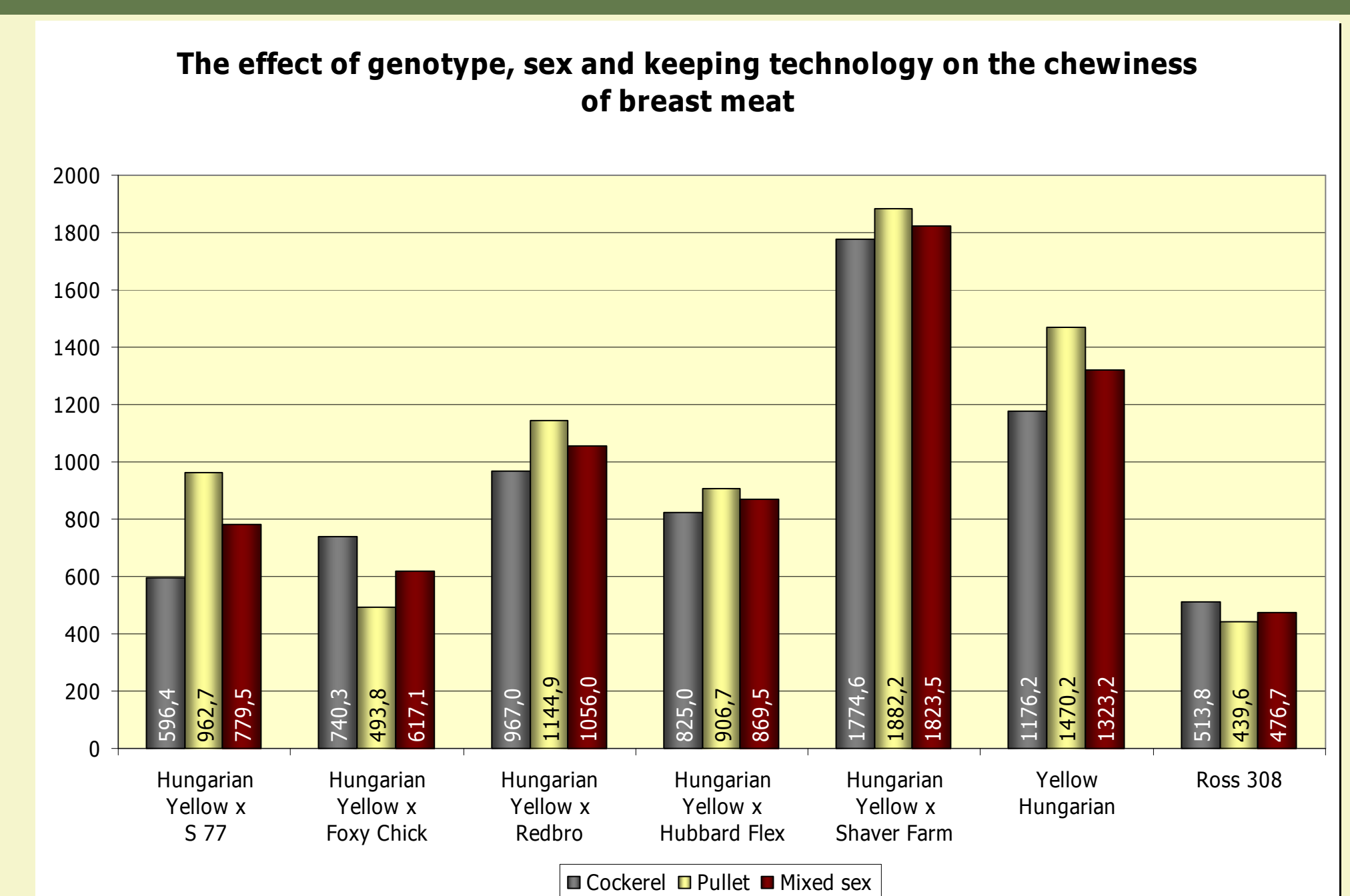
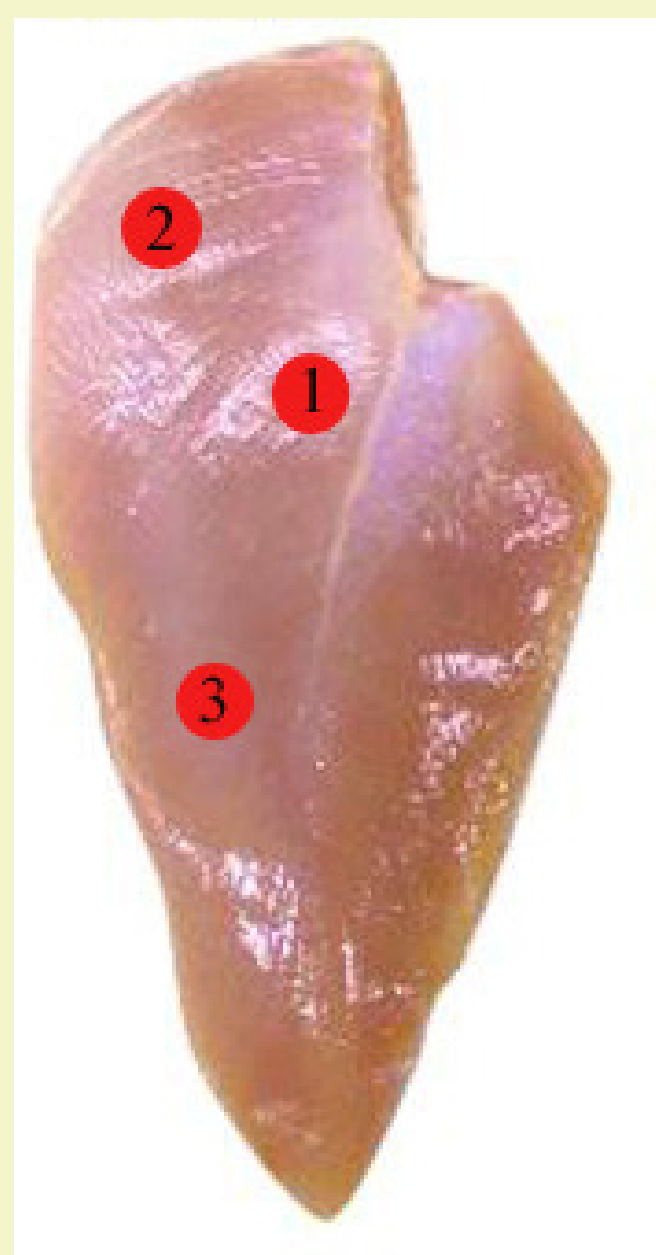


Figure 3



The examination points on the breast fillet



Stevens QTS 25



Hungarian Yellow cock



DISCUSSION

Hardness, gumminess and chewiness results of breast meat were unambiguously affected by genotype and keeping technology; all the measured attributes were significantly ($P < 0.05$) higher in chickens reared in free-range conditions compared to those of industrially reared birds. Hardness of meat as a textural parameter means that more force is needed to bite completely the meat with incisors, to press the meat between molars and disintegration of meat before swallowing needs more mastication movements and energy. Consideration of this parameter related to the nationality, the age and the taste of the consumers. In our opinion, the Hungarian customers are expected to note a positive difference in taste between free-range and industrial conventional poultry because of their earlier experience related to taste of free-range products.