Proceedings of the XLIX Italian Society of Agricultural Genetics Annual Congress
Potenza, Italy – 12/15 September, 2005
ISBN **88-900622-6-6**

Poster Abstract - C.70

STUDY OF MELANOCORTIN-4 RECEPTOR (*MC4R*) POLYMORPHISM IN ITALIAN LARGE WHITE AND ITALIAN DUROC PIGS: ASSOCIATION WITH CARCASS AND MEAT QUALITY TRAITS

R. DAVOLI*, I. NISI*, S. BRAGLIA*, L. FONTANESI*, L. BUTTAZZONI**, V. RUSSO*

*) DIPROVAL, Sezione di Allevamenti Zootecnici, Faculty of Agricolture, University of Bologna, Via F.lli Rosselli 107, 42100 Reggio Emilia, Italy
**) Associazione Nazionale Allevatori Suini, 00161 Roma, Italy - roberta.davoli@unibo.it

pig, melanocortin-4 receptor, PCR-RFLP, carcass and meat quality traits

The melanocortin-4 receptor (*MC4R*) plays an important role in the control of mammalian energy homeostasis. In pig this gene, mapped on chromosome 1 (SSC1) shows a single nucleotide polymorphism (G>A) within a *Taq I* restriction site. The alternative alleles resulted in either aspartic acid (GAU) or asparagine (AAU) at position 298 in a region that is highly conserved in the MCR proteins. Kim *et al*., (*Mammalian Genome* 11:131-5; 2000) reported an association between allele A with higher backfat content, higher feed consumption, and faster growing in pigs. By PCR-RFLP the *MC4R* polymorphism was studied in 316 pigs belonging to 11 breeds including Italian Large White, Italian Landrace, Italian Duroc, Belgian Landrace, Hampshire, Pietrain, Meishan, Cinta Senese, Casertana, Calabrese, Nera Siciliana. A preliminary analysis of the relationship between *MC4R* polymorphism and pig production traits was performed. To this aim the allele frequencies between pigs with divergent breeding values (EBV) for backfat thickness (BFT), lean cut (LC), average daily gain (ADG) in Italian Large White breed and for intermuscular visible fat (VIF) in Italian Duroc breed were compared by Fisher exact test. For each trait, 100 pigs were considered, 50 with high and 50 with low EBV values. Significant differences of allele frequencies between divergent Italian Large White pigs were identified for BFT, ADG, and LC. Allele A was the most frequent in pigs with high EBVs for ADG and BFT ($P \leq 0.01$), and in pigs with low values for LC ($P = 0.003$). Moreover the association between the *MC4R* polymorphism with carcass and meat quality traits was further evaluated in a group of 272 Italian Large White pigs by a linear model which included boar and genotype as source of variation. A significant effect of *MC4R* genotype was found. The overall results showed that *MC4R* could be considered a candidate gene associated with production traits in pigs.