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The genotend chip: a new tool to analyse gene expression in muscles of beef cattle for beef quality predictionJ.-F. Hocquette*¹, C. Bernard-Capel², V. Vidal³, B. Jesson³, H. Levéziel⁴, I. Cassar-Malek¹.¹INRA, UR1213, Unité de Recherches sur les Herbivores, Theix, 63122 Saint-Genès Champanelle, France.²Institut de l'Élevage, Paris,³IMAXIO, Saint-Beauzire, ⁴UMR 1061/Université de Limoges, 87060 Limoges FranceCorresponding author: jfhocquette@clermont.inra.fr**Abstract**

Previous programmes funded by APIS-GENE and the French National Agency for Research have described new genes associated with beef tenderness. One of these results concerning the DNAJA1 gene was patented (Bernard et al., 2007, J. Agric. Food Chem. 2007, 55, 5229-5237; Genomic marker for meat tenderness; Patent EP06300943.5, September 12, 2006, WO/2005/052133). The GENOTEND program aims to confirm the relationship between these genes and beef quality. To reach this objective, we developed an Agilent chip with specific probes of the bovine muscular genes known as predictors of beef quality. More than 3000 genes involved in muscle biology or meat quality were selected from genetic, proteomic or transcriptomic studies, or from scientific publications. As possible, several probes were used for each gene (e.g. 18 probes for DNAJA1). RNA from Longissimus thoracis muscle samples of Limousin young bulls or of Charolais young bulls or steers slaughtered in 2003 or 2005 was hybridised on the chips. Statistical analyses allowed to select the genes associated with beef tenderness. All the DNAJA1 probes gave similar results. For the Charolais animals slaughtered in 2003, the DNAJA1 expression was negatively correlated with the initial or global beef tenderness ($r = -0.40$ to -0.60) in young bulls or steers. However, it was not the case for the animals slaughtered in 2005 indicating that conditions of production must be taken into account for the prediction of beef quality. With the Limousin young bulls, we observed a negative correlation of DNAJA1 expression with muscle content of calpastatin ($r = -0.30$) but not with the other data. The expression of other genes belonging to the same family as DNAJA1 or linked to other metabolic pathways was associated with beef tenderness. In conclusion, numerous markers of beef tenderness can be identified but they are often specific of an animal type (steer or young bull), of a breed or of environmental conditions. However, some gene families (including that of DNAJA1) seemed associated with beef quality. The IMAXIO Company is proposing in service the transcriptomic analysis of bovine muscles.