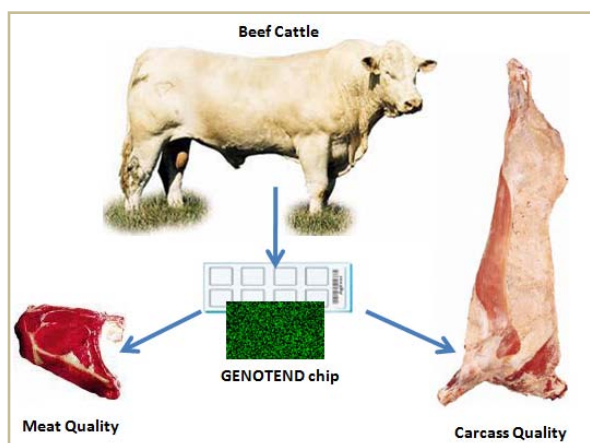


THE GENOTEND CHIP: AN OLIGOCHIP BASED ON GENOMIC MARKERS FOR THE PREDICTION OF BEEF QUALITY

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Beef quality depends on factors associated with production, processing and meat preparation. Today, information on quality is only obtainable after slaughtering, which is a limitation to the delivery of a consistent quality meat. Recently, muscle gene expression profiling revealed that unsuspected genes may be potential "genomic markers" of sensory attributes, especially tenderness (Bernard et al., 2007, J. Agric. Food Chem. 2007, 55, 5229-5237). The GENOTEND program aims to confirm the relationships between these genes and intrinsic quality attributes of meat quality (e.g. tenderness, flavour, juiciness, marbling).



*DNAJA1 transcript abundance has been correlated with toughness (Bernard et al., 2007)

The GENOTEND chip

- 8X15K chip (Agilent technologies)
- 60 mer (genes involved in muscle growth, fibre types and fat metabolism, DNAJA1*)
- Several probes per gene
- Cost : ≈ 700-750 euros per sample

ANIMALS (*Longissimus thoracis* muscle)

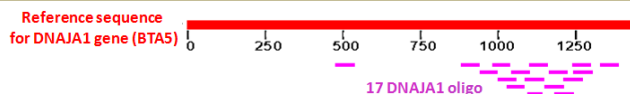
MUGENE programme

(animals slaughtered in 2003 or 2005)

- 68 Charolais young bulls (15 or 19-month-old)
- 44 Charolais steers (30-month-old)

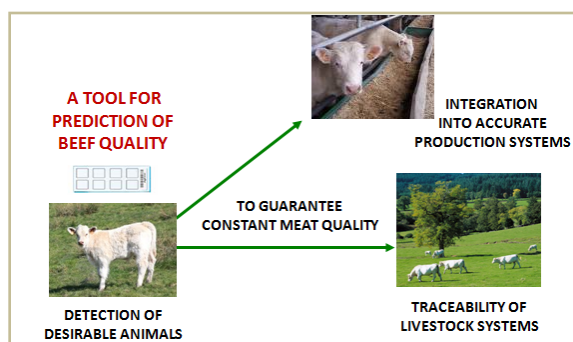
QUALVIGENE programme

- 124 Limousin young bulls (16-month-old)



- similar results with all DNAJA1 probes
- negative correlation between **DNAJA1** expression and the initial or global beef **tenderness** ($r = -0.40$ to -0.60) (Charolais young bulls and steers) in 2003 but not in 2005.
- negative correlation between **DNAJA1** expression and **calpastatin** muscle content (Limousin young bulls, $r = -0.30$)
- correlation between expression of **other members of the DNAJA1 family** or linked to other metabolic pathways and beef tenderness

In conclusion, we have developed a chip enabling analysis of molecular indicators in order to detect live animals with desirable quality attributes. However, the genomic markers of beef tenderness are specific of an animal type (steer or young bull), of a breed or of production conditions linked to the environment. Some gene families (including that of DNAJA1) are associated with beef quality.



Acknowledgments:

Consortium QUALVIGENE (Institut de l'Elevage, UNCEIA, INRA : QuaPa, UNH, URH, UGMA, GABI); MUGENE (QuaPa, UGMA, GABI, URH) and GEMQUAL;

Experimental farms (Bourges, Le Pin) and Slaughterhouse (Theix) at INRA; B. Picard, D. Gruffat (URH), D. Rocha (UGMA), L. Journaux (Apis-Gène) for helpful discussions.