

UR1213 Herbivores

Animal Muscle Meat Team (Amuvi)

A delay in the development of bovine clones



Cattle clones and donor (right) –Experimental Farm Inra Bressonvilliers

Cloning can contribute to animal selection and preservation of endangered breeds. But animal clones may present abnormalities. We noted a delay in the development of muscles of cattle clones and their offspring, linked to a lower content of protein and an under-expression of genes involved in myogenesis.

The project aimed at describing in detail myogenesis and muscle properties in cattle produced by somatic cloning during their foetal development and their first two years postnatally. The strategy of the project was to use high throughput technologies to analyse gene expression and protein abundance in the muscles in combination with conventional laboratory analyses (histology, biochemistry and molecular biology).

Our data showed a delayed differentiation of the muscles of clones from the first month of foetal life and a delayed maturity of their muscles up to their first year of life. Differences in the abundance of proteins and gene transcripts related to the progression of myogenesis were detected from the first foetal month in the muscles of clones compared with controls. The muscles of clone offspring showed only a partial delay in physiological maturation.

Epigenetic marks may be changed in clones, in particular in genes related to myogenesis, and will be sought to gain an understanding of the differences in gene expression. The use of food products or animal feed derived from cloned cattle is banned in the European Union. However, the offspring of clones have already entered the food chain (USA, Japan). The publications and communications from the project have been forwarded to the European Food Safety Authority (EFSA) responsible for assessing the risks regarding food and feed safety.

Partners (scientific and /or professional): Collaboration between the URH and BDR units of the Inra Phase Division and the Experimental farm (UCEA) Inra Bressonvilliers.

References

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Contact: Cassar-Malek Isabelle Isabelle.cassar-malek@clermont.inra.fr. Inra, UR1213 - Herbivores, 63122 St-Genès-Champanelle, France