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Florence Gondret, Annie Vincent, Sophie Daré, Isabelle Louveau

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Resources and characteristics of gene pool of native breed Latvian Blue cow in 2017I. Sematovica¹, M. Lidaks² and I. Kanska²¹Latvia University of Life Sciences and Technologies, Faculty of Veterinary Medicine, Helmana 8, 3004, Latvia, ²Animal Breeders Association of Latvia, Republikas laukums 2, Rīga, 1010, Latvia; isem@inbox.lv

The Latvian Blue cow (LZ) breed is one of the primitive cattle breeds (*Bos primigenius taurus*). It is a very rare breed, characteristic only for Latvia and it is actually in the FAO extinction category. Measures have been taken to protect LZ breed with support of the Latvian government. Now due to the ERAF project No. 1.1.1.1/16/A/025, *BioReproLV* it is become possible to save LZ breed by using multiple ovulation and embryo transfer (MOET). The LZ variety is mainly used for milk production. The aim of this study was to evaluate resources of LZ cow breed and to analyse results of cow's linear parameters. Data were taken of Agricultural Data Centre Republic of Latvia in 2017 and evaluation *in vivo*. In 2017, 339 LZ cows were genebank (GB) animals and 140 of them were culled by different reasons in this year. There were 544 (190 of which were primiparous) standard lactations registered in 2009 and only 314 (56 of which primiparous) in 2017. Productivity of all registered LZ cows was 5,320.6±2,060.51 kg/lactation with milk protein (MP) 3.4±1.36% and milk fat (MF) 4.24±1.73%, but LZ GB cow average milk yield was 5,381.2±1,857.08 kg/lactation, MP 3.4±1.22%, MF 4.23±1.56%. At the moment the oldest LZ GB cow is 16.3 years old and 20% of LZ GB cows are more than 10 years old, and only 10% are younger than 5 years. The overall exterior rating was established more than 80 points for 64.4% of evaluated LZ GB cows. Some LZ GB linear parameters did not change significantly ($P>0.05$) with age – legs and hoofs, udder, dairy form, rump angle, foot angle, fore udder attachment, rear teat position, milking speed and cow temperament. No statistically significant differences ($P>0.05$) regarding all parameters of linear evaluation among LZ and LZ GB dairy cows except tendency regarding to body depth ($P=0.054$). No 100% purebred LZ cow exists. To become one of LZ GB cows, an animal must have certain properties characteristic to LZ breed and appropriate origin at least 60% of LZ. It is clear that the measures to save LZ breed was not effective enough so far. MOET will be one of the promoter instrument to fulfil Pedigree Law regarding to LZ GB cow.

Session 10

Theatre 1

Hepatic molecular changes induced by a high-fat high-fibre diet in growing pigs

F. Gondret, A. Vincent, S. Daré and I. Louveau

INRA, Pegase, Rennes, 35042, France; florence.gondret@inra.fr

The introduction of more fibre to cereal-based diets in pigs gained interest due to new economic considerations and to potential health and welfare benefits. The addition of fat to a fibre-rich diet is required to maintain dietary energy value for performance. Feeding pigs a high-fat high-fibre diet, however, changes the energy source and nutrients as compared to a low-fat high-starch diet. The liver plays a central role in energy metabolism. This study was undertaken to investigate hepatic molecular pathways in pigs fed diets with contrasting sources of energy and nutrients. From 74 d of age onwards, 48 Large White castrated male pigs were fed a high-fat high-fibre diet (HF, n=24) or a low-fat high-starch diet (LF, n=24). Diets were formulated to be isoenergetic and isoproteic. Starch derived from cereal grains (wheat and barley) in the LF diet was partially replaced by rapeseed and soybean oils in the HF diet and crushed wheat straw (insoluble fibre) was included as a diluent of dietary energy in this diet. At 132 d of age, the liver was excised, weighed and processed for biochemical and molecular analyses. Transcriptomics analysis was performed using porcine microarrays (Agilent, GPL16524, 8 × 60K). Functional pathways were deduced from genes declared as differentially expressed ($P<0.01$) using DAVID Bioinformatics Resources and Ingenuity Pathway Analysis. Compared with LF pigs, HF pigs had a lower ADG and ADFI ($P<0.01$) during the test period. At slaughter, the liver was lighter (-7%, $P=0.03$) in HF than in LF pigs. In liver, the protein content was unaffected but the glycogen content and glucokinase activity were reduced in HF pigs compared with LF pigs ($P<0.05$). A total of 802 annotated genes were differentially expressed between the two diets. In HF pigs, genes involved in glycogen and hexose metabolism and genes participating to oxidative phosphorylation and ATP synthesis were down-regulated. Conversely, genes contributing to cell growth, cell cycle phase, cell death and cell adhesion were up-regulated. Liver hyper-proliferation, hepatic fibrosis, and liver necrosis were suggested as top-toxicity functions responding to diet. In conclusion, pig liver functions can be affected by dietary components such as fibres and lipids.