

Genetic parameters for major fatty acids and proteins in French dairy sheep

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The French PhénoFinlait project has been carried out to study milk composition in fatty acids (FA) and proteins of dairy ruminants. Profile in FA has been of increasing interest because of their importance in human health. Milk composition in protein is relevant to the dairy industry for cheese making process. The aim of this study was to evaluate feasibility of genetic selection to improve sheep milk quality. Genetic parameters were estimated by restricted maximum likelihood with an animal model using 67,013 test-day records from 11,747 Lacaune (LAC) and 8,159 Manech red faced (MRF) ewes in first and second lactation. Traits considered were milk yield, total fat content (FC) and protein content (PC), mono and poly-unsaturated FA (MUFA and PUFA) and saturated FA (SFA) contents in fat, and caseins (κ -CN, α S2-CN, α S1-CN, β -CN), total caseins (CN) and whey proteins (WP) contents in protein. Heritability estimates for FA were moderate (SFA: 0.26-0.28, MUFA: 0.23-0.25, PUFA: 0.25-0.25, for MRF and LAC resp.). FA contents in fat were not correlated with milk yield. FC was positively correlated to SFA (0.40 and 0.20 in MRF and LAC, resp.), and negatively with MUFA and PUFA (-0.27 and -0.41 with PUFA in MRF and LAC, resp.). Heritability estimates for proteins were moderate to high and ranged from 0.17 (for CN in MRF) to 0.46 (for WP in LAC), with larger differences between breeds than for FA. Genetic correlations between caseins were positive (0.13 to 0.47) except α S2-CN, showing null or negative correlations with others (-0.26 to -0.31 with α S1-CN). Selection on FC would involve an increase in SFA in milk fat and selection on major FA or protein profiles is possible in French dairy sheep.

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