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Phenotyping goats on their feeding behaviour

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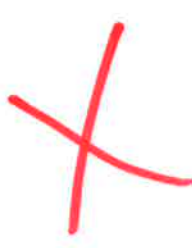
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Genetic parameters of ability to tolerate once-daily milking in a Holstein × Normande populationH. Larroque¹, L. Heuveline¹, S. Barbay², Y. Gallard² and J. Guinard-Flament³¹INRA, UR631 SAGA, 31320 Castanet-Tolosan, France, ²INRA, UE326 Domaine Expérimental du Pin, 61310 Exmes, France, ³INRA, UMR1348 PEGASE, 35590 St-Gilles, France; helene.larroque@toulouse.inra.fr

To be well adapted to once daily-milking (ODM), a dairy cow has to exhibit low relative milk yield loss when switched to ODM and strong milk recovery when back to twice daily-milking (TDM). The aim of this study was to investigate genetic variability of relative milk yield loss and recovery and their genetic relationships with fat and protein contents (FC and PC, resp.) in order to evaluate predictive ability of milk composition. The study concerned 368 F2 crossed Holstein×Normande dairy cows in 2nd lactation. The trial consisted of 3 successive periods: 1 wk with TDM (TDM1), 3 wks with ODM and 2 wks with TDM (TDM2). Genetic parameters were estimated by restricted maximum likelihood with an animal model. Milk yield averaged 28.3 kg/d during TDM1 (± 5.4); it decreased by 8 kg/d (± 2.9) (i.e. 28.2%) during ODM and increased by 4.0 kg/d (± 2.5) (i.e. 20.5%) when switched back to TDM. FC and PC were 43.2 g/kg (± 6.4) and 31.7 g/kg (± 2.4) respectively during TDM1; they increased during ODM to 48.6 g/kg (± 7.1) and 32.5 g/kg (± 2.3) resp. Heritability was moderate for relative milk loss (0.26 ± 0.08) and higher for relative milk recovery (0.43 ± 0.06), with between them a correlation of $-0.43 (\pm 0.13)$. As expected, heritability of FC and PC were high on TDM1 (0.46 ± 0.10) and on ODM (0.56 ± 0.09 and 0.66 ± 0.08 , resp.). Relative milk loss was positively correlated to TDM1 FC and PC (0.28 ± 0.15 and 0.50 ± 0.13 , resp.), whereas relative milk recovery was correlated to ODM FC and PC (0.24 ± 0.18 and -0.59 ± 0.08 , resp.) and to TDM1 FC and PC but with very high SE (not shown). Despite the low staff and the use of a crossbred population this study has shown that relative milk yield loss and recovery in response to ODM are under genetic control. They are partially related together and to milk composition. This analyze will be carried on by a QTL detection.

Phenotyping goats on their feeding behaviourC. Duvaux-Ponter^{1,2}, S. Giger-Reverdin^{1,2}, J. Tessier^{1,2}, E. Ricard³, J. Ruesche³, I. David³ and L. Bodin³¹INRA, UMR791 MoSAR, 75005 Paris, France, ²AgroParisTech, UMR791 MoSAR, 75005 Paris, France, ³INRA, UR631 SAGA, 31326 Castanet Tolosan, France; christine.duvaux@agroparistech.fr


The evolution of farming systems due to societal demand for a more sustainable production will require adaptation of farming techniques as well as improvement of the adaptive capacity of production herbivores in the face of new challenges resulting from climate change. Animals can adapt to a new diet by modifying their feeding behaviour, and more precisely their intake rate. The aim of this work was to look for new, pertinent and repeatable criteria to evaluate this trait. Feeding behaviour was assessed at three different periods (1st gestation, 1st lactation, 2nd gestation + lactation). All the renewal goats born in January 2011 were tested. They were housed in individual crates with automatic measurement of the quantity of feed eaten every 2 min (3 days of measurement) and fed *ad libitum* a complete diet adapted to requirements (two feed allowances per day). Thirty-six goats completed the three periods of measurement. Statistical analyses were performed with the mixed procedure of SAS to test the individual fixed effects, and ASREML to estimate variance components. Four different phenotypes were analyzed: Q90 (quantity of diet consumed 90 min post evening feed allowance which corresponded to two thirds of the daily feed allowance), P90 (Q90/Total quantity of feed consumed after the evening feed allowance), Area₂₄ and Area₁₅ (average difference between the cumulative intake at each time point and the cumulative intake at time t; either over 24 h or over the evening feed allowance (15 h)). Intra-period individual repeatabilities were very high (~ 0.84) for the four criteria, while they were lower between periods (~ 0.30) but still significantly different from zero. These preliminary results on the variability of intake rate show that simple criteria could be found to phenotype goats on intake rate.

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