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## **Selecting on fat and protein content instead of milk yield would not improve dairy cows' fertility**

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To compare reproductive performances of cows with high genetic merit for fat and protein content vs high genetic merit for milk yield, an experiment was conducted on 500 cows at the INRA farm of Le Pin-au-Haras. The herd was composed of Holstein and Normande cows. In each breed, cows with high genetic merit for milk yield were classified in a 'Milk Group' (MG) and those with high genetic merit for fat and protein content were classified in a 'Content Group' (CG) with equivalent milk solids production over the lactation. Two grazing-based feeding systems were used, a 'High' (maize silage / grazing plus concentrate) and a 'Low' (grass silage / grazing with no concentrate) system. To study the different steps of the reproductive process, milk progesterone information (3/week), oestrous behaviour recording and pregnancy diagnosis (ultrasonography) were combined. Within breeds, cows in the CG had an earlier resumption of luteal activity than cows in the MG (-6 d,  $P=0.01$ ). Occurrence of prolonged luteal phases was not related to genetic groups. Both genetic groups had similar ovulation detection rate and proportion of standing behaviour. No difference in fertility was found between genetic groups in Normande cows. Holstein cows in the CG showed more non-fertilization/early embryo mortality in the Low system (+31 points,  $P=0.002$ ) and more late embryo mortality/foetal death in the High system (+18 points,  $P=0.06$ ). The MG was exporting more energy in early lactation because of a higher milk yield peak and the CG was exporting more energy in mid-lactation because of a better persistency. Trade-off between milk production and reproduction was not found: cows in the MG had a degraded cyclicity and those in the CG had a degraded fertility. Selecting dairy cows on fat and protein content may not be a promising way to maintain good productive and reproductive performances.