

Bodyweight change

Introduction

Materials and methods

Data

Bodyweight equations

We developed new predictive equations to estimate dairy cows' bodyweight using partial least square regressions based on the new data in the calibration sets. These equations were minor updates of those already developed in (Tedde et al. 2021) and (Soyeurt et al. 2019), in which the authors used the milk yield, parity, days in milk, and spectrometry milk analysis to develop bodyweight predictive equations. In addition, in this study, we added natural splines to estimate better the curvilinear relationship between the dairy cows' bodyweight and `dim` or `milk_yield` variables. Furthermore, based on the known relationships between the `milk_yield`, `parity`, and `milk_yield` variables (ref), we investigated further these connections through linear and nonlinear interaction, called tensor product smooth using gam models. The equations are summarized in table X.

Results

- Soyeurt, H., E. Froidmont, I. Dufrasne, D. Hailemariam, Z. Wang, C. Bertozzi, F. G. Colinet, F. Dehareng, and N. Gengler. 2019. "Contribution of Milk Mid-Infrared Spectrum to Improve the Accuracy of Test-Day Body Weight Predicted from Stage, Lactation Number, Month of Test and Milk Yield." *Livest. Sci.* 227 (September): 82–89. <https://doi.org/10.1016/j.livsci.2019.07.007>.
- Tedde, Anthony, Clément Grelet, Phuong N. Ho, Jennie E. Pryce, Dagnachew Hailemariam, Zhiquan Wang, Graham Plastow, et al. 2021. "Validation of Dairy Cow Bodyweight Prediction Using Traits Easily Recorded by Dairy Herd Improvement Organizations and Its Potential Improvement Using Feature Selection Algorithms." *Animals* 11 (5): 1288. <https://doi.org/10.3390/ani11051288>.

equation id	equation term
benchmark	$dim + my + parity$
benchmark	$pls(dim + my + parity + MIR)$

Table 1: trucmuch