Letter to the editor: Estimation of milk fatty acid yield: A response to Stamey et al. (2010)

F. Glasser,¹ M. Doreau, A. Ferlay, and Y. Chilliard

INRA, UR1213 Herbivores, Site de Theix, F-63122 Saint-Genès-Champagnelle, France

In their letter to the editor, Stamey et al. (2010) comment on our technical note titled “Estimation of milk fatty acid yield from milk fat data” (Glasser et al., 2007). Both our technical note and the letter by Stamey et al. (2010) are in agreement on several facts: 1) that quantifying fatty acids secreted in milk is important for nutritional studies on milk fat quality; 2) that during the mammary esterification of fatty acyls (i.e., fatty acid radicals from which the –OH group has been removed) on the glycerol backbone to form milk triglycerides, the oxygen in the ester bond comes from the glycerol (as stated in our technical note); and 3) that what many publications previously reported as milk “fatty acid” yields based on the method published by Schauff et al. (1992) were, in fact, “fatty acyl” yields (which was the rationale behind our technical note).

The question that remains is whether authors should be reporting fatty acyl or fatty acid yields. As explained in our technical note, for consistency reasons we advocate the calculation of fatty acid flows in milk production studies in which the authors want to integrate or link fatty acid flows measured at different levels (such as intake, digestive, or metabolic flows) and milk fatty acid yields. Calculating milk fatty acyl flows can introduce bias when other flows such as digestive flows are reported as fatty acids. When the focus is mammary metabolism itself, teams can choose the mechanistically

accurate calculation; that is, fatty acyl flows, while verifying consistency between the expression of fatty acid input and output flows in net mammary balance studies.

The choice between fatty acid flow and fatty acyl flow thus depends on the aim of the study, and we join Stamey et al. (2010) in urging authors to indicate clearly whether they are reporting milk fatty acyl flows or milk fatty acid flows. In our technical note, based on a database of 558 milk fatty acid profiles, we calculated a mean proportion of $94.4 \pm 0.2\%$ (mean $\pm$ SD) fatty acids in milk triglycerides, equivalent to $93.3 \pm 0.2\%$ of fatty acids in total milk lipids (taking into account mono- and diglycerides, NEFA, cholesterol esters, and phospholipids present in milk fat). Using the same database, the mean coefficients for the proportion of fatty acyls were $87.9 \pm 0.4\%$ in milk triglycerides and $87.0 \pm 0.4\%$ in total milk lipids. These 4 coefficients are thus proposed as estimators of either fatty acid or fatty acyl moieties of milk triglycerides or total lipids, depending on the aims of the specific studies.

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¹Corresponding author: frederic.glasser@clermont.inra.fr