

# FATTY ACID VARIATION BETWEEN FORAGE SPECIES AND WITHIN POPULATIONS AND FATTY ACID CONTENT OF BEEF FINISHED ON PASTURE WITH DIFFERENT FORAGE SPECIES

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## ABSTRACT

We describe two experiments; the first experiment was conducted in a greenhouse where four forage species – orchardgrass (*Dactylis glomerata* L.), tall fescue [*Lolium arundinaceum* (Schreb.) S.J. Darbysh = *Schedonorus arundinaceus* (Schreb.) Dumort.], perennial ryegrass (*Lolium perenne* L. ssp. *perenne*), and alfalfa (*Medicago sativa* L. ssp. *sativa* and *falcata* (L.) Arcang) were used to determine between and within variation. Perennial ryegrass contained the largest amount of  $\alpha$ -linolenic and total FA while alfalfa possessed the greatest amount of linoleic acid. Populations within each species showed significant variation for nearly all FAs examined. Additionally,  $\alpha$ -linolenic and total FA had the greatest correlation to the phenotypic trait, total chlorophyll. The second experiment was a field-scale grazing trial with steers finished on three pasture treatments: tall fescue, tall fescue with red clover (*Trifolium pretense* L.), and tall fescue with alfalfa. The pasture treatments were different for crude protein, neutral detergent fiber (NDF) digestible neutral detergent fiber (dNDF, on a proportion basis), *in vitro* true digestibility (IVTD) and FAs myristic (C14:0), palmitic (C16:0), palmitoleic (C16:1), steric (C18:0), oleic, (C18:1) linoleic (C18:2), and total FAs. Steers (*Bos taurus* L.) grazing pastures with either red clover or alfalfa had greater average daily gains than cattle grazing tall fescue alone. However, differences found in pasture FAs did not translate into differences for any FA examined in beef. Therefore, it seems that factors other than forage FA concentration, like cattle genetics, are more important than the type of forage being fed to produce beef with high levels of omega-3 FA.