
DIRECT AND RESIDUAL EFFECT OF FISH OIL SUPPLEMENTATION ON CONJUGATED LINOLEIC ACID (CLA), OMEGA -3 AND OTHER FATTY ACIDS ON MILK FAT OF GRAZING DAIRY COWS

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ABSTRACT

Eight Holstein dairy cows in mid lactation and fed on rotational grazing were selected aimed at studying the effects of grass supplementation with 320g fish oil (OP) upon cow performance and milk fatty acids (AG_s) profile. Particularly, the experiment looked for a residual effect of OP on milk fat content (TB) and on some bioactive AG_s like conjugated linoleic acid (CLA), trans-vaccenic acid (C18:1 trans-11-TVA) and omegas n-3 acids (C20:5, EPA and C22:6, DHA). Cow's performance data and milk samples were collected immediately before the experiment commenced (PEXP), on the last day (21^o d) of OP supplementation period (POP) and during four successive periods of 10 days following OP withdrawal (P1, P2, P3 and P4). OP supplementation significantly ($P < 0.05$) decreased the estimated dry matter intake, milk fat content (less 13.4 g Kg⁻¹) and milk fat yield. No effect was detected in milk production, milk protein content, milk protein yield and live weight. While the concentration on milk fat of stearic acid (C18:0), short (C6:0 to C12:0) and medium chain (C14:0 to C16:0) AG_s was depressed ($P < 0.05$), the concentrations of oleic acid cis/trans isomers, CLA, linolenic acid (C18:3 n-3), EPA and DHA significantly ($P < 0.05$) increased. However, transfer efficiency of EPA and DHA from fish oil to milk fat was very low (1.5%). There was no effect of OP on oleic (C18:1 cis-9) and linoleic (C18:2 cis-9, cis-12) acids of milk. OP decreased ($P < 0.05$) the hipercholesteremic fraction (AG_s C12:0, C14:0 and C16:0) of milk fat and increased ($P < 0.05$) in total C18:1 and omega n-3. No residual effect of OP was expressed, exception made on the very long chain fatty acids i. e. > C20, EPA, DHA and DPA (C22:5 n-3) whose concentrations on milk was kept high over the forty-day post-treatment period.

Key-words: conjugated linoleic acid (CLA), dairy cows, fatty acids, omega n-3, pasture