

**Fishmeal supplementation to high producing Jersey cows
grazing ryegrass or kikuyu pasture**

by

Evelyn Rhoda Malleson

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MSc Agric (Animal Nutrition)

Department of Animal and Wildlife Sciences

Faculty of Natural and Agricultural Sciences

University of Pretoria

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SUMMARY

FISHMEAL SUPPLEMENTATION TO HIGH PRODUCING JERSEY COWS GRAZING RYEGRASS OR KIKUYU PASTURE

by

E.R. Malleson

Supervisor: Prof L.J. Erasmus
Co-supervisor: Prof W.A. Van Niekerk
Department: Animal and Wildlife Sciences
Faculty: Natural and Agricultural Sciences
University of Pretoria
Pretoria
Degree: MSc Agric (Animal Nutrition)

Rumen-undegradable protein might be the first limiting nutrient for high producing dairy cows receiving high levels of maize supplementation while grazing pasture. To test this hypothesis two trials were conducted using fishmeal as a high quality protein source rich in rumen-undegradable protein, Methionine and Lysine. In the first trial cows grazed annual ryegrass for two months in spring. In the second trial cows grazed kikuyu for two months in late summer. In addition to the pasture cows received 6 kg (as is) of a maize-based supplement, including minerals, fed in two equal portions in the milking parlour. A randomised complete block design was used. Three groups of 15 (ryegrass) or 14 (kikuyu trial) cows received control (no fishmeal), low fishmeal (4 % fishmeal replacing maize) or high fishmeal (8 % fishmeal replacing maize) treatments. Multiparous, high producing, Jersey cows in early to mid lactation were used. Milk production was measured and milk samples taken fortnightly. Simultaneous studies were conducted using eight rumen cannulated cows receiving the control and high fishmeal treatments in a cross over design experiment. Ruminal pH, ammonia-N and volatile fatty acid concentrations were measured.

In the ryegrass trial milk yield, 4 % fat-corrected milk yield and milk fat and protein percentages of cows on the low and high fishmeal treatments (21.9 and 22.1 kg milk/d, 24.1 and

24.2 kg 4 % fat-corrected milk/d, 4.73 and 4.67 % fat and 3.49 and 3.45 % protein) were significantly higher than the control (20.5 kg milk/d, 20.4 kg 4 % fat-corrected milk/d, 3.97 % fat and 3.25 % protein). There was no treatment effect on milk urea N (16.8, 17.4 and 17.9 mg/dl, for the control, low fishmeal and high fishmeal treatments, respectively). The ruminal ammonia-N concentration was significantly higher in the cows on the high fishmeal treatment than the control (16.67 vs. 14.16 mg/dl). Fishmeal supplementation to cows on ryegrass is profitable under any realistic price scenarios in South Africa.

In the kikuyu trial cows on the high fishmeal treatment produced significantly more milk (19.5 kg/d) than the cows on the control (18.2 kg/d), neither differing from the low fishmeal treatment (18.9 kg/d). The cows on the low fishmeal treatment had significantly higher milk fat percentage (4.18 %) than the control (3.71 %), neither differing from the high fishmeal treatment (3.91 %). The cows on the two fishmeal treatments produced significantly more 4 % fat-corrected milk than the control (19.4 and 19.2 vs. 17.3 kg 4 % fat-corrected milk/d). There was no treatment effect on milk protein percentage (3.30, 3.41 and 3.34 % for the control, low and high fishmeal treatments, respectively). Milk urea N was significantly higher for the high fishmeal treatment (10.80 mg/dl) than the control and low fishmeal treatments (9.09 and 9.44 mg/dl). Ruminal ammonia-N concentration was significantly higher in the cows on the high fishmeal treatment than the control (6.52 vs. 4.74 mg/dl). Fishmeal supplementation to cows on kikuyu could be profitable under certain price scenarios.