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The effects of bovine somatotropin injections on mammary blood flow in dry and lactating dairy cows

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An improved milk yield due to bovine somatotropin (BST) was found to correspond to an increased mammary blood flow (Mepham *et al,* 1984) and cardiac output (Davis *et al,* 1988). As milk yield and mammary blood flow were closely related, we attempted to determine primary effects (blood flow or milk secretion) by comparing mammary blood flow responses to BST in lactating and dry cows.

Two dry and 3 lactating Holstein cows were used. Recombinant BST (Lilly France) was injected sc (30 mg/d) over an 8-d period. Daily mammary blood flow was measured in the common external pudic artery by ultrasound transit-time blood flowmeter. Measurements were taken during the day before the first injection and on the first, 4th and 8th d of injection as well as 2 and 8 d after the last injection. Results were expressed on a half-udder basis.

Lactating cows showed a significant increase ($P < 0.05$) in milk yield (+1.3 kg/d) after the 4th injection (half-udder milk yield on d 0, 1, 4, 8, 10 and 16 was 13.5, 13.8, 15.2, 15.0, 14.1 and 13.5 kg/d). The blood flow: milk yield ratio was slightly increased (504 to 529 l/kg) due to BST injections. The shape and level (maximum increase of +0.7 l/min) of the blood flow responses were quite similar to those obtained in dry cows (fig 1). These results suggest that an increased blood flow can be responsible for part of the BST effects on milk yield.

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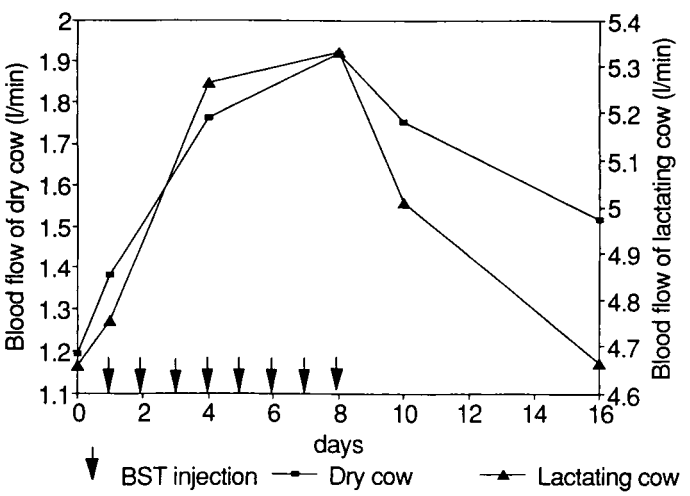

Fig 1. Effects of BST injections on half-udder blood flow.