

SEAG-Symposium, 27.-31.8.2001, Los Baños, The Philippines

“Resource Management:

Private-Public Partnership and Knowledge Sharing”

Studies on Milk Production Potential of the Etawah Crossbreed Goat and the Bali Cow (*Bibos banteng*).

D.A. Astuti*, I.A.M. Sukarini** and D. Sastradipradja***

*Dept. Physiology & Pharmacology, Fac. Vet. Medicine IPB

**Dept. Animal Production, Fac. Anim. Sci. UDAYANA University

***Retired Professor of IPB

ABSTRACT

At the first SEAG-Symposium at Bogor, Indonesia, September 2000, one of us (DS) presented a paper giving an outline of metabolic research being conducted at the Metabolic Research Center at IPB. The research basically uses balance trials in combination with experimental approaches and methodologies feasibly carried out in the (Indonesian) humid tropical environment. In continuation to that communication, the present paper reports on results of studies aiming at enhancing milk production of indigenous ruminants, i.e. the Etawah crossbreed goat and the Bali cow (*Bibos banteng*). The studies on the goat used 12 first lactation does (BW 25 ± 5.0 kg) allotted into 3 dietary level of feeding treatment groups R1, R2 and R3 that received 100%, 85% and 70%, respectively of *ad libitum* intake. The rations offered were pellets (17.2%CP and 18.9 MJ GE/kg) and fresh *Penisetum purpureum* grass. Results show that ME (MJ/d) = $4.23 + 0.713 \text{ RE} + 0.003 \text{ ADG} + 0.006 \text{ RP} + 0.002 \text{ MY}$ ($R^2 = 0.86$) and IP (g/d) = $84.05 - 5.36 \text{ RE} + 0.055 \text{ ADG} - 0.16 \text{ RP} + 0.068 \text{ MY}$ ($R^2 = 0.45$). Milk protein ranged from 3.06 to 3.5% and milk fat averaged 5.2%. Glucose kinetics, assessed by radioisotopic tracer techniques is active, but glucose flux is low compared to temperate ruminant breeds which may implicate its role to support milk production. The studies on Bali cows used 12 primiparous cows (initial BW 263.79 ± 21.66 kg) for 16 weeks starting immediately post calving. Four dietary treatment groups R1, R2, R3 and R4, receiving from the last 2 months of pregnancy onwards, rations based on a mixture of locally available grass and legume feed *ad libitum*. R1 contained 70% elephant grass (PP, *Penicetum purpureum*) plus 30% *Gliricidia sepia* leaves (GS), R2 was 30% PP plus 25% GS supplemented with 55% *Hibiscus tiliacius* leaves (HT, defaunating effect), R3 and R4 were 22.5% PP + 41.25% GS + 11.25% HT + 25% concentrate, with R4 supplemented with zinc di-acetate. Milk production and body weights were monitored, an energy and protein balance trial conducted, overall glucose kinetics parameters assessed, mammary blood flow (MBF) and metabolite arteriovenous differences (ΔAVs) measured to get uptake data and mammary performance relationships. Parameters of glucose kinetics at peak lactation or during dry condition were not affected by ration quality. Glucose pool size, space of distribution and flux increased by 61.77, 62.26 and 82.08%, respectively, during lactation compared to the dry period. Mean glucose flux of lactating Bali cows was $5.52 \text{ mg/min.kgBW}^{0.807}$ which resembles the range of values of temperate dairy cows. Calculation showed that glucose requirements for maintenance, milk lactose and fat-glycerol synthesis, and the formation of NADPH_2 reached 320.62 mg/min, which was less than the average glucose flux of lactating Bali cows of 481.35 mg/min. Mammary blood flow (MBF) values ranged from 56 to 83 l/h. Mammary glucose uptake ranged from 120 to 140 g/kg milk. Glucose uptake was 2 to 4 times the amount secreted as lactose, lower than the calculated mammary glucose needs and that little lactose was synthesized. The excess glucose taken-up was used for other metabolic processes.