

## Letters to the Editor

### *Evolution of mammals*

#### **Mammary – and other – glands**

Madam

A recent item in your Out of the Box column questioned the relevance of the inclusion of the champion cyclist Lance Armstrong in our review 'Evolution of lactation: nutrition *v.* protection with special reference to five mammalian species'<sup>(1)</sup>. In general it has obviously achieved our aim of stimulating thought and interest in the evolution of lactation.

In the review we mainly discuss the importance of the mammary gland to the evolutionary success of mammals. This was supported by both the large proportion of daily resting energy directed to lactation and the compensatory functional responses of the mammary glands within an individual mammal<sup>(2)</sup>. When twelve piglets suckling twelve teats of a sow were restricted to suckling only six teats, milk production in the remaining functional six glands increased to the extent that the growth of the twelve piglets was maintained<sup>(3)</sup>.

Although it could be argued that this may be the result of increased suckling pressure on the restricted number of teats, such is not the case with a study in cows that was carried out at the Hannah Research Institute, before it was unfairly considered to be a sub-prime research asset. The udder halves of two groups of cows (one high producers and the other low producers) were milked four times per day. When milk production had stabilised, the milking frequency of one udder half of each cow was reduced to twice daily milking and, as expected, milk production from the twice-daily milked halves decreased significantly. However, there was a compensatory increase in milk production in the udder halves that continued to be milked four times per day<sup>(4)</sup>. This physiological response was independent of any change in milk removal from the udder half.

We felt that it was relevant to note the suggestion that another important paired reproductive organ also might show similar compensatory functional responses<sup>(5)</sup>. However, the testicular response referred to seems to be more in line with the sow rather than the cow example. It would be difficult to design an experimental protocol examining changes in testicular function associated with a unilateral decrease from four times per day to twice per day.

The potential for the above compensatory responses in the synthetic capacity of the mammary gland obviously has positive implications for facilitating the survival of the suckling mammal under circumstances, such as mastitis, that significantly limit milk synthesis in the infected gland<sup>(6)</sup>.

Holly McClellan

School of Biomedical, Biomolecular and Chemical Sciences  
Email: hlm@student.uwa.edu.au

Sue Miller

School of Animal Biology

Peter Hartmann

Winthrop Professor, School of Biomedical, Biomolecular  
and Chemical Sciences  
The University of Western Australia  
M310, 35 Stirling Highway  
Crawley, WA 6009, Australia  
doi:10.1017/S1368980009990887

### *References*

1. Cannon G (2009) Out of the Box. *Public Health Nutr* **12**, 584–586.
2. McClellan HL, Miller SJ & Hartmann PE (2008) Evolution of lactation: nutrition *v.* protection with special reference to five mammalian species. *Nutr Res Rev* **21**, 97–116.
3. Auldist DE & King RH (1995) Piglets' role in determining milk production in the sow. In *Manipulating Pig Production V: Proceedings of the Fifth Biennial Conference of the Australasian Pig Science Association*, pp. 114–118 [DP Hennessy and PD Crawnwell, editors]. Werribee: Australasian Pig Science Association.
4. Knight CH (1999) Metabolic stress unravelled. *Hannah Research Institute Yearbook* 32–37.
5. Atwood CS & Bowen RL (2007) Metabolic clues regarding the enhanced performance of elite endurance athletes from orchiectomy-induced hormonal changes. *Med Hypotheses* **68**, 735–749.
6. Fetherston CM, Lai CT & Hartmann PE (2006) Relationships between symptoms and changes in breast physiology during lactation mastitis. *Breastfeed Med* **1**, 136–145.

### *Leaf concentrate*

#### **Not only lucerne**

Madam

In a recent note within your letters section, you asked for evidence of the effects of leaf concentrate from sources other than Lucerne<sup>(1)</sup>.

I am a Professor of Food and Nutrition at the University of Rajasthan in Jaipur. I have been working with leaf concentrate prepared from berseem and cowpea leaves, as well as from lucerne, for over two decades. At first I worked with its presentation and acceptability, and then I carried out a number of supplementary feeding trials with children, women, adolescent girls and pregnant women. The nutritional value of leaf concentrate is significant, but acceptability poses problems at higher levels.