

Livestock production — Man must measure

Jan Bonsma

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According to its editor, this edition of *Livestock Production* is a slightly altered version – to cater for North American readers – of Bonsma's original book that was published in South Africa by Tafelberg Publishers. The scientific content is unchanged. This edition was published in 1983 but recently advertised and thus brought to the attention of the South African Veterinary Association, who requested that it be reviewed.

Prof. Jan Bonsma is revered as the greatest animal scientist of his time by the Bonsmara Cattle Breeders' Society of South Africa and is very highly rated by the livestock industry in general, both locally and in the USA. His dictum 'man must measure' has resulted in the creation of one of the most successful beef cattle breeds in South Africa judging by the following criteria:

- It has by far the largest number of stud females registered with the SA Stud Book – ±75 000;
- 100 % of them are performance-tested animals; thereby far exceeding other breeds;
- Bonsmara bulls have achieved the highest prices at sales for several consecutive years, including 2006.
- More Bonsmara embryos than of any other beef breed have been exported to foreign countries.

Although the idea of creating a functionally efficient beef breed, based on the Santa Gertrudis model, which is adapted to South African subtropical conditions, was conceived by his boss, Prof. AM Bosman, the credit for the practical development of the Bonsmara on the experimental farm Mara goes to Bonsma. Mandatory measurement of performance, which now also allows for the estimation of breeding values by the BLUP (Best Linear Unbiased Prediction) technique, is the cornerstone on which the Bonsmara breed rests. Show standards are out – the breed does not participate in shows.

However, despite the well-argued case for the use of adapted breeds of cattle in the tropics, the veterinarian and animal scientist who seek the necessary supporting experimental evidence for this belief in this 2nd edition of Bonsma's book are in for a bit of a disappointment. Let us consider Bonsma's main arguments:

1. *Resistance to tick-infestation and tick-borne diseases*

There is no doubt that the indigenous Afrikaner cattle [now regarded as a Sanga-type of *Bos taurus*, rather than a Zebu (*Bos indicus*) on the basis of genetic evidence] on Mara experimental farm had considerably lower tick burdens (species not identified) than the exogenous animals. The mortality rate from heartwater (confirmed microscopically by the local state veterinarian) was also much lower in the Afrikaners than in the European breeds (inferred from Table 18).

There is reliable anecdotal evidence that Bonsma was severely criticised by 3 eminent veterinarians – who shall remain nameless – at a meeting where he made a case,

based on his observations, for the use of adapted cattle in endemic heartwater areas. Today it is common farming practice. His research on the above characteristics was sound.

2. *Tropical degeneration*

Bonsma ascribed his observations that exogenous breeds gained appreciably less weight than adapted animals on the Messina experimental farm to what he called 'tropical degeneration'. He concluded that this was due to a markedly suppressed appetite caused by chronic hyperthermia due to the environment. However, there is no indication that he considered or excluded other possible causes of poor growth such as tick infestations. Were the animals perhaps suffering from chronic anaemia or severe tick worry?

Bonsma did not provide proof for 'tropical degeneration' by means of properly controlled experiments.

3. *Thickness of skin and sleekness of coat*

Bonsma ascribed the Afrikaner's resistance to tick infestation and 'tropical degeneration' to its thick skin and sleek hair coat. His data show that Afrikaners had significantly thicker skins and sleeker coats than the exotic breeds. Over and above the fact that only the thickness of the epidermis is relevant to successful tick feeding and that measurement of both epidermis and dermis may not be a valid parameter, Australian researchers have shown that Jersey cattle – with their particularly thin skins – are second only to Brahmans in their resistance to infestation with ticks like *Boophilus microplus*. Moreover, exposure to ticks is essential to trigger the manifestation of resistance, *i.e.* resistance to tick infestation is basically an immunological phenomenon. It has nothing to do with the thickness of the skin or the nature of the coat. The sleekness of the hair coat may be a factor in adaptation to subtropical heat. Holsteins, however, produce considerably less milk when exposed to high environmental temperatures despite their sleek coats. Heat tolerance is apparently a more complex phenomenon than Bonsma thought.

The system used for giving references is very frustrating. Why wet the appetite of the reader by making copious reference to authors in the text when virtually none of them appear in the 'Select Bibliography'? Such references are worthless if they cannot be checked. In the 'Introduction' it is mentioned that Bonsma published more than 180 articles, but only 1 – titleless – appears in the Bibliography.

I shall remember and admire Bonsma for his almost uncanny powers of observation and for the elegant demonstration of the value of scientifically based measurement – the Bonsmara breed of cattle – rather than for the scientific value of his book.

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