

McMEEKAN MEMORIAL AWARD FOR OUTSTANDING SERVICES TO AGRICULTURE

John Fredrick Smith

John Smith is a worthy recipient of the McMeekan Memorial Award for 1994, particularly in recognition of his recent contributions to identifying the role of the nutritional components which produce the increase in lambing rates obtained when ewes are "flushed" immediately before tupping. John has conducted research in many areas of reproduction in farmed livestock during the previous 25 years, but this Award must specifically apply to work undertaken during the last five years.

The practice of "flushing" ewes immediately before tupping has been a common practice in New Zealand's sheep flocks. The responses in terms of increased twinning rate and decreased barrenness have been sufficiently reliable to justify continued use of the practice even though there have been frequent debates among scientists and producers, including some at meetings of this Society. These debates centred on issues involving the digestibility, quantity and clover content of the forage, as well as the body condition, liveweight, age and breed of ewes and the timing of the changes in feeding management either within the breeding season or in relation to ram introduction.

John completed a series of diverse experiments at Ruakura and elsewhere in New Zealand in collaboration with other scientists. The results of these experiments first established that nutritional factors such as pasture quality could influence ovulation rate irrespective of ewe liveweight. Whereas the energy content of the diet affected ovulation rate in a linear manner, the effect of protein content was more stepwise. An abomasal infusion of protein could increase ovulation rate, prompting examination of the hepatic axis having an effect on the feed-back mechanisms. Results of further studies indicated that a local ovarian response was associated with this feed-back effect and that it involved branched-chain amino acids (BCAA). It was finally shown that the involvement of these BCAA's was not direct, but that their concentration did reflect an animal's relative nutritional status.

The concepts derived from these studies have been confirmed in recent Australian research showing that the "flushing" effect is at the ovarian follicular level. It involves growth hormone, insulin and glucose in a process which modifies the production of androstenedione by the thecal cells and consequently limits oestradiol production by granulosa cells.

The results of John's studies have been reported in 48 publications from 1975, including 13 to this Society, 9 in peer

reviewed journals and 4 as book chapters. No less than 17 of the 48 were published from 1990 to 1994, clearly establishing the work as meeting the timing criteria pertinent to this Award.

This comprehensive series of experiments represents a significant scientific contribution to understanding nutritional factors influencing ovulation rates in sheep flocks in New Zealand. The extent to which these results have been made available to scientists, advisers, producers and students is a good example of John's commitment to "technology transfer". It reflects the spirit of Dr McMeekan's philosophy to see the results of research delivered promptly to livestock producers as the ultimate users of that research.

Although John's nomination for this Award relates specifically to the described recent research, his lifetime's work in livestock reproduction extends from 1962 when he completed the degree of B.Sc.Agric at the University of Sydney and commenced studying for M.Sc. Agric. and Ph.D. degrees with Professor T J Robinson. John was the first recipient of the EHB Lefroy Post-doctoral Research Fellowship at the University of Western Australia from 1969 to 1972, coming to Ruakura as a Scientist in the latter year.

John's publication list totals 242, including 117 refereed publications. Sheep AI (45), synchronisation of oestrus in cattle (51), sheep nutrition relative to ovulation rate (48) and responses to steroid immunisation (30) are only some of the major areas of research endeavour included in this publication list. John's most recent areas of interest have been in seasonality, infertility associated with zearalenone, and diluents suitable for use with ram semen.

This Society has been one of John's main professional associations. He was Secretary from 1978 to 1981, and Vice-President, President and Immediate Past-President in 1982, 1983 and 1984 respectively. He has subsequently Chaired Society sub-committee's including the recent one on Conference Organisation and Proceedings Publication. This latter appointment was an appropriate one because John has authored or co-authored 56 papers published in the Society's proceedings. After this 1995 Conference, the revised total will be 62!

It has not been a difficult task to prepare this oration. The facts speak for themselves and make John Frederick Smith a deserving recipient of the McMeekan Memorial Award from the New Zealand Society of Animal Production.