

Lloyd Richmond Fell

Academic Qualifications:

Bachelor of Rural Science (University of New England)	1962
Master of Rural Science (University of New England)	1967
Doctor of Philosophy (University of Melbourne) Thesis on <i>The Neuroendocrine Regulation of Prolactin</i>	1974
Graduate Diploma of Social Ecology (University of Western Sydney) Major Project: <i>Stress the Musical</i>	1989

Recent Positions Held:

Senior Research Scientist and Research Leader – NSW Agriculture, and
Honorary Fellow in the Centre for Neuroscience and Animal Behaviour
University of New England, Armidale, NSW, Australia

Membership of Scientific Societies included:

International Society of Applied Ethology
International Society of Comparative Psychology
The Scientific and Medical Network
The Australasian Society for the Study of Animal Behaviour
The Society for Constructivism in the Human Sciences
The Personal Construct Psychology (PCP) Interest Group

Research Areas (including over \$2 million of research grants awarded):

Stress, behaviour, health and welfare
Cognition and communication
Second-order cybernetics in relation to both the above

Publications:

Approximately 160 published papers, articles or chapters, 60 of these in scientific journals. The majority prior to 1987 were on aspects of neuroendocrinology or animal husbandry; since then mostly on animal stress in relation to immunity, health and welfare. Many were on animal behaviour, in the last decade dealing with aspects of cognition which arose from the biological research of Maturana and Varela. Since 1991 this has included papers on aspects of human cognition and behaviour, particularly related to communication and education.

Representative papers are listed below:

Selected Journal Papers (on neuroendocrinology and endocrinology)

- Fell L.R.** and Mullord M. (1966) Methods of bioassay of oxytocin and vasopressin. *N. Z. Med. J.* **65**: 787.
- Fell L.R.**, Blockey M.A. de B., Beck C., Catt K.J., Brown J.M., Cumming I.A. and Goding J.R. (1971) Prolactin in the dairy cow during suckling and machine milking. *J. Reprod. Fertil.* **24**: 144.
- Fell L.R.**, Beck C, Brown J.M., Cumming I.A. and Goding J.R. (1972) Radioimmunoassay of ovine prolactin. The secretion of prolactin as affected by milking, oestradiol administration and onset of parturition. *J. Reprod. Fertil.* **28**: 133.
- Fell L.R.**, Beck C., Brown J.M., Catt K.J., Cumming I.A. and Goding J.R (1972) Solid-phase radioimmunoassay of ovine prolactin in antibody-coated tubes. Prolactin secretion during estradiol treatment, at parturition and during milking. *Endocrinol.* **91**: 1329.
- Goding J.R., Buckmaster J.M., Cerini J.C., Cerini M.E.D., Chamley W.A., Cumming I.A., **Fell L.R.**, Findlay J.K. and Jonas H. (1973) Gonadotrophins in the ovine oestrus cycle. *J. Reprod. Fertil. Suppl.* **18**: 31.
- Cummins L., Blockey M.A. de B., **Fell L.R.** and Goding J.R. (1973) Plasma prolactin release about oestrus and after suckling in the beef cow. *J. Reprod. Fertil.* **32**: 319.
- Fell L.R.**, Perry G.S., Chandler N.J. and Goding J.R. (1973) Effect of the interval between milkings on prolactin release and milk production in the cow. *J. Reprod. Fertil.* **32**: 317.
- Fell L.R.**, Findlay J.K., Cumming I.A. and Goding J.R. (1973) The effect of synthetic TRF on prolactin release in sheep. *Endocrinol.* **93**: 215.
- Fell L.R.**, Chandler N.J. and Goding J.R. (1974) Effects of inhibition of prolactin secretion by 2-Br-a-ergocryptine at parturition and during lactation in dairy cows. *J. Reprod. Fertil.* **36**: 480.
- Chamley W.A., **Fell L.R.**, Alford F.P. and Goding J.R. (1974) Twenty-four hour secretion profiles of prolactin and growth hormone. *J. Endocrinol.* **61**: 165.
- Fulkerson W.J., **Fell L.R.** and McDowell G.H. (1975) Artificial induction of lactation in ewes: the role of prolactin. *Aust. J. Biol. Sci.* **28**: 525.
- Fulkerson W.J., Hooley R.D., McDowell G.H. and **Fell L.R.** (1976) Progesterone and induction of lactation in ewes. *J. Reprod. Fertil.* **46**: 512.
- Fulkerson W.J., Hooley R.D., **Fell L.R.** and McDowell G.H. (1976) Artificial induction of lactation in ewes: the involvement of progesterone and prolactin in lactogenesis. *Aust. J. Biol. Sci.* **29**: 357.
- Fulkerson W.J., McDowell G.H., Hooley R.D. and **Fell L.R.** (1977) Artificial induction of lactation in ewes: the use of prostaglandin. *Aust. J. Biol. Sci.* **30**: 573.
- Hooley R.D., **Fell L.R.** and Findlay J.K. (1977) The effect of 2-bromo- α -ergocryptine and 2-chloro- α -methylergoline-8 β -acetonitrile (lergotril mesylate) on the prolactin secretion of the ewe. *Acta. Endocrinol.* **86**: 722.

Major Scientific Review Articles (on animal husbandry)

Fell L.R. (1964) Machine milking and mastitis - a review. *Dairy Sci. Abst.* **26**: 551.

Wheeler S.M. and **Fell L.R.** (1983) Fluorides in cattle nutrition. *Nutr. Abstr. Review* **53**: 741.

Selected Journal Papers (on the biology of stress)

Shutt D.A. and **Fell L.R.** (1985) Comparison of total and free cortisol in bovine serum and milk or colostrum. *J. Dairy Sci.* **68**: 1832.

Fell L.R., Shutt D.A. and Bentley C.J. (1985) Development of a salivary cortisol method for detecting changes in plasma free cortisol arising from acute stress in sheep. *Aust. Vet. J.* **62**: 403.

Fell L.R., Wells R. and Shutt D.A. (1986) Stress in calves castrated surgically or by the application of rubber rings. *Aust. Vet. J.* **63**: 16.

Fell, L.R. and Shutt, D.A. (1986). Adrenocortical response of calves to transport stress as measured by salivary cortisol. *Can. J. Anim. Sci.* **66**: 637-641.

Shutt, D.A., **Fell, L.R.**, Connell, R., Bell, A.K., Wallace, C.A. and Smith, A.I. (1987). Stress-induced changes in plasma concentrations of immunoreactive β -endorphin and cortisol in response to routine surgical procedures in lambs. *Aust. J. Biol. Sci.* **40**: 97-103.

Shutt, D.A. **Fell, L.R.**, Connell, R. and Bell, A.K. (1988). Stress responses in lambs docked and castrated surgically or by the application of rubber rings. *Aust. Vet. J.* **65**: 5-7.

Shutt, D.A., Smith, A.I., Wallace, C.A., Connell, R. and **Fell, L.R.** (1988). Effect of myiasis on plasma immunoreactive β -endorphin, ACTH, and cortisol in the sheep. *Aust. J. Biol. Sci.* **41**: 297-301.

Fell, L.R. and Shutt, D.A. (1989). Behavioural and hormonal responses to acute surgical stress in sheep. *Appl. Anim. Behav. Sci.* **22**: 283-294.

Shutt D.A., Connell R. and **Fell L.R.** (1989) Effects of ovine corticotrophin-releasing factor and vasopressin on plasma β -endorphin, cortisol and behaviour after minor surgery in sheep. *Life Sci.* **45**: 257-262.

Adams D.B., Lynch J.J., Anderson B.H., **Fell L.R.**, Hinch G.N. and Munro R.K. (1990) The intensity of resistance by mature Merino ewes against *Haemonchus contortus* and *Trichostrongylus colubriformis* in single-species and combined-species infection. *Aust. Vet J.* **67** : 443-445.

Fell L.R., Lynch J.J., Adams D.B., Hinch G.N., Munro R.K. and Davies H.I. (1991) Behavioural and physiological effects in sheep of a chronic stressor and a parasite challenge. *Aust. J. Agric. Res.* **42** : 1335-1346.

Chapman, R.E., **Fell, L.R.** and Shutt, D.A. (1994) A comparison of stress in surgically and non-surgically mulesed sheep. *Aust. Vet J.* **71** : 243-247.

Adams, D.B. and **Fell, L.R.** (1997) The effect of infection with the abomasal nematode, *Haemonchus contortus*, on the avoidance behaviour of sheep in a motivational-choice test. *Int. J. Parasitol.* **27** : 665-673.

Selected Conference Papers (on neuroendocrinology and endocrinology)

Fell L.R., Blockey M.A. de B., Beck C., Catt K.J., Brown J.M., Cumming I.A. and Goding J.R. (1970) The control of milk secretion: levels of prolactin during suckling and milking in dairy cows. *Proc. xviii Int. Dairy Congr.* **1E**: 590.

Fell L.R., Blockey M.A. de B., Beck C., Brown J.M., Cumming I.A., Winfield C.G. and Goding J.R. (1970) Circulating levels of prolactin in cows and sheep. *Proc. 4th Asia Oceania Congr. Endocrinol.*, p.91.

Fell L.R., Mullord M. and Whittlestone W.G. (1970a) The control of milk ejection: levels of oxytocin and vasopressin during suckling and milking in the dairy cow. *Proc. xviii Int. Dairy Congr.* **1E**: 591.

Fell L.R., Mullord M. and Whittlestone W.G. (1970b) Circulating levels of oxytocin and vasopressin in the cow. *Proc. 4th Asia Oceania Congr. Endocrinol.*, p.92.

Goding J.R., Buckmaster J.M., Cerini J.C., Cerini M.E.D., Chamley W.A., Cumming I.A., **Fell L.R.**, Findlay J.K. and Jonas H. (1972) Control of luteal function. *Excerpta Medica Int. Cong. Series 273*, p. 927.

McCloyhry C.E., **Fell L.R.** and Drinan J.F. (1980) Oestrone, oestradiol-17 β , prolactin, α -lactalbumin and lactose concentration in the mammary secretion of dairy cows around parturition. *Proc. Aust. Soc. Reprod. Biol.* **12**: 89.

Fell L.R. and McCloyhry C.E. (1982) The effect of synthetic ACTH administered during late gestation on ovine placental lactogen and milk secretion. *Proc. Aust. Soc. Reprod. Biol.* **14**: 12.

Fell L.R. and Shutt D.A. (1986) Use of salivary cortisol as an indicator of stress due to management practices in sheep and calves. *Proc. Aust. Soc. Anim. Prod.* **16**: 203.

Shutt D.A., **Fell L.R.**, Connell R., Wallace C.A. and Smith A.I. (1986) Changes in plasma cortisol and β -endorphin in response to routine surgery in lambs. *Proc. Endocrinol. Soc. Aust. Abstract 104*.

Fell L.R. (1987) Behavioural responses to husbandry stressors in lambs. *Proc. Aust. Soc. Anim. Behav.*, p. 12.

Shutt, D.A. and **Fell, L.R.** (1988). The role of endorphins in the response to stress in sheep and cattle. *Proc. Aust. Soc. Anim. Prod.* **17**: 338-341.

Fell, L.R. and Shutt, D.A. (1988). Salivary cortisol and behavioural indicators of stress in sheep. *Proc. Aust. Soc. Anim. Prod.* **17**: 186-189.

Fell L.R. and Shutt D.A. (1989) Development of an arena test to measure aversion in stressed sheep. *Proc. 16th Ann. Conf. Australasian Soc. Anim. Behav.*, p.7.

Shutt D.A., **Fell L.R.**, Adams D.B. and Lynch J.J. (1990) Effects of *Haemonchus contortus* in pen-fed versus paddock sheep as determined by plasma cortisol and insulin-like growth factor-1. *Proc. Aust. Soc. Anim. Prod.* **18** : 360-363.

Fell L.R., Lynch J.J., Adams D.B., Hinch G.N. and Munro R.K. (1990) The behavioural response of immune sheep to a challenge infection with an internal parasite. *Proc. 17th Ann. Conf. Australasian Soc. Anim. Behav.*, p. 10.

Barnett J.P, **Fell L.R.**, Lynch J.J., Adams D.B., Hinch G.N., Munro R.K. and Gates G.R. (1990) Effect of opiate antagonist and antihistamine on behaviour of immune ewes infected with *Haemonchus contortus*. *Proc. 17th Ann. Conf. Australasian Soc. Anim. Behav.*, p. 11.

Fell L.R., Lynch J.J., Adams D.B., Hinch G.N. and Munro R.K. (1990) Effects of a challenge infection with *Haemonchus contortus* on the behaviour of penned versus paddock sheep. *Proc. Aust. Soc. Anim. Prod.* **18** : 475.

CURRICULUM VITAE

Fell L.R., Lynch J.J., Adams D.B., Hinch G.N., Barnett J.P., Gates G.R. and Bertus F.V. (1990) Behaviour following challenge infections with *Haemonchus contortus* in immune and non-immune sheep. *Proc. Scientific Meeting, Aust. Behavioural Immunol. Group*, p. 4.

Adams D.B., **Fell L.R.**, Lynch J.J., Barnett J.P., Gates G.R. and Hinch G.N. (1990) The time-course of behavioural effects of immune responses to challenge infection with *Haemonchus contortus* in sheep. *Proc. 1st Scientific Meeting, Aust. Behavioural Immunol. Group*, p. 6.

Barnett J.P., Adams D.B., Lynch J.J., **Fell L.R.**, Hinch G.N., Munro R.K. and Gates G.R. (1990) Evidence for a link between endogenous opiate and immune systems in sheep infected with *Haemonchus contortus*. *Proc. 1st Scientific Meeting, Aust. Behavioural Immunol. Group*, p. 5.

Barnett J.P., Gates G.R., Lynch J.J., Adams D.B., **Fell L.R.**, Hinch G.N., Davies H.I. and Gregson R.A.M. (1991) Interpretation of motivational mechanisms of sheep in an arena test. *Proc. 18th Ann. Conf. Australasian Soc. Anim. Behav.* p. 8.

Behrendt R., **Fell L.R.**, Newman R., Rigby R.D.G., Hoskinson R.M. and Wynn P.C. (1991) Active immunisation against ACTH (1-24) modifies the behaviour of merino sheep. *Proc. Scientific Meeting Aust. Endocrin. Soc.* Abstract 143, p. 111.

Degabriele R. and **Fell L.R.** (1992) Interleukin-1 production and behavioural adaptation. *Proc. 2nd Scientific Meeting, Aust. Behavioural Immunol. Group*, p. 12.

Fell, L.R. and Clarke, M.R. (1993) Behaviour of lot-fed cattle. *Recent Advances in Animal Nutrition in Australia 1993*. Dept. Biochem., Microbiol. and Nutrition, Univ. of New England, Armidale, NSW, Australia. pp 107-116.

Watson, D.L. and **Fell, L.R.** (1993) Stress and immune competence in feedlot cattle. *Recent Advances in Animal Nutrition in Australia 1993*. Dept. Biochem., Microbiol. and Nutrition, Univ. of New England, Armidale, NSW, Australia. pp 130-136.

Selected Journal and Conference Papers (on cognition and communication)

Fell, L.R. and Russell, D.B. (1991) The practice of science: the research-development relationship with particular reference to agriculture. *Proc. Gadamer Action and Reason Conf.* University of Sydney, pp. 25-30.

Fell L.R. (1991) Sheep behaviour: does it matter what sheep think? *Rural Science Annual*, University of New England, Armidale, pp. 45-47.

Ison, R.L., Russell, D.B. and **Fell, L.R.** (1993) Knowledge - You can't give it away. *Proc. Universities as Interpretive Communities Conf.*, University of Sydney, pp. 169-174.

Fell, L.R. and Russell, D.B. (1994) Towards a biological explanation of human understanding. *J. Cybernetics and Human Knowing* 2 : (4) 3-15.

Book Chapters (on stress/cognition and Maturana's biological research)

Fell L.R. and Shutt D.A. (1989) The concept of stress in farm animals - a review. In Rose M. and Large A. (Eds) *Animal Ethics Committees - The Role of Veterinarians*, p. 66.

Gates G.R., **Fell L.R.**, Lynch J.J., Adams D.B., Barnett J.P., Hinch G.N., Munro R.K. and Davies H.I. (1992) The link between immune responses and behaviour in sheep. *Chapter 3 in Husband A.J. (Ed) Behaviour and Immunity*, CRC Press, Boca Raton, pp. 23-41.

Fell, L.R. and Russell, D.B. (1994) Biology's Room With a View. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. and Russell, D.B. (1994) An Introduction to "Maturana's" Biology. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. and Russell, D.B. (1994) Living Systems - Autonomous Unities. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. and Russell, D.B. (1994) Non-Traditional R & D. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. (1994) Stress, Epistemology and Feedlot Cattle. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Russell, D.B., Dimitrov, V. and **Fell, L.R.** (1994) Ancient Wisdom and Contemporary Ecological Problems. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. and Russell, D.B. (1994) The Dance of Understanding. In Fell, L.R., Russell, D.B. and Stewart, A.H. (Eds) *Seized by Agreement, Swamped by Understanding* - A collection of papers to celebrate the visit to Australia in August 1994 by Humberto Maturana. ISBN 0 646 20084 4 - Hawkesbury Printing - University of Western Sydney, Richmond, NSW, Australia.

Fell, L.R. (1996) The Struggle to Integrate. In Ryan, J.S. (Ed.) *Rural Science: Philosophy and Application*. School of Rural Science, University of New England, Armidale, NSW, Australia, p 464-467.

Fell, L.R. and Russell, D.B. (in press - 1998) The Human Quest for Understanding and Agreement. Chapter 3 in Ison, R. and Russell, D.B. (Eds) *Breaking With Tradition – A New Approach to Agricultural Extension*. Cambridge University Press, London, UK.

Recent Student Supervision, Examining and Teaching Activities:

Robert Degabriele - PhD - University of Western Sydney, Macarthur - Stress and Immunity

Stephen Wilson - PhD - University of Wollongong - Indicators of Animal Welfare

Honours students – Centre for Neuroscience and Animal Behaviour, University of New England.

I have supervised numerous Masters and Honours students from the University of Sydney, University of NSW and University of Western Sydney, Hawkesbury over the last 10 years and examined about a dozen postgraduate theses including one PhD thesis from Ronald Proudford at the University of NSW on Public Health Administration.

I have served as an invited lecturer on many occasions at the University of Sydney, University of NSW, University of Western Sydney and University of New England, mainly on stress physiology and behaviour and, more recently, on second-order cybernetics

Other Professional Activities:

External reviewer of the Department various University Departments.

External reviewer of numerous research grant applications in Australia and New Zealand.

External referee for numerous scientific journal papers in Australia and New Zealand.

Committee member of several scientific societies at various times.

Research team leader, Conference organiser, occasional press, TV, radio appearances.

Maintaining the only Australian web site on autopoiesis and the international network associated with this.

Conducting workshops on the application of Maturana's biological research and second-order cybernetics to improving the quality of life of individuals and societies.

Songwriting and performing, particularly in connection with workshops on cognition and communication.