

Mhairi A. Sutherland, Ph.D.

Scientist

AgResearch Ltd, Innovative Farm Systems, Hamilton

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Professional Preparation

Massey University, Palmerston North, New Zealand	B.Sc. 1996
Massey University, Palmerston North, New Zealand	M.Sc. 1999
University of Illinois, Urbana, Illinois, USA	Ph.D. 2005

Appointments

2009-Present	Scientist, Innovative Farm Systems, AgResearch Ltd, New Zealand
2008-2009	Assistant Professor, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA
2007-2008	Visiting Assistant Professor, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA
2005-2007	Postdoctoral Fellow, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA

Research experience

2009-Present	Scientist, Innovative Farm Systems, AgResearch Ltd, New Zealand
2008-2009	Assistant Professor, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA
2007-2008	Visiting Assistant Professor, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA
2005-2007	Postdoctoral Fellow, Department of Animal and Food Sciences, Texas Tech University, Lubbock, Texas, USA
2002-2005	Research assistant, Department of Animal Sciences, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA

Honors and awards

2010-Present	Adjunct graduate faculty, Texas Tech University, Lubbock, Texas, USA
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Research

Awarded grants:

2010

- Evaluation of a potential phenotypic indicator of temperament and stress in sheep (Curiosity fund, AgResearch Ltd, \$NZ 30,000)

2009

- Alleviating the pain associated with dehorning and castration in beef calves (Darden foundation \$US 52,000)
- The use of different gases and gas combinations to humanely euthanize young suckling pigs (National Pork Board \$US 67,200)
- Practical methods to reduce the pain associated with piglet processing (National Pork Board \$US 76,940)

2008

- Methods to reduce the pain associated with castration (National Pork Board \$US 71,127)
- Developing best management practices for on-farm euthanasia of young pigs using carbon dioxide gas (National Pork Board \$US 79,164)

- Gestation sow housing: literature review and assessment of needs (National Pork Board \$US 24,997)

2006

- Space requirements of weaned pigs during transport (National Pork Board \$US 83,990)
- Is tail docking necessary and if so, how long should the tail be? (National Pork Board \$US 86,734)
- Long distance transport of breeding stock (National Pork Board \$US 117,000)

Teaching experience

Classes:

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| 2009 | Contemporary issues in animal welfare |
| 2008 | Contemporary issues in animal welfare, swine production, and anatomy (supervisor) |
| 2007 | Swine production |
| 2006 | Topics in stress, behavior and welfare (online graduate course taught in collaboration with Dr. John McGlone at Texas Tech University and Dr. Janeen Salak-Johnson at the University of Illinois) |

Refereed publications

- Sutherland MA**, Rogers AR, Verkerk GA. The effect of temperament and responsiveness towards humans on the behavior, physiology and milk production of multi-parous dairy cows in a familiar and novel milking environment. *Physiology and Behavior* (in press).
- Sutherland MA** and Huddart FJ. The effect of training first lactation heifers to the milking parlor on behavioral reactivity to humans and the physiological and behavioral responses to milking and productivity. *Journal of Dairy Science* (in press).
- Dowling SK and **Sutherland MA**. 2012. The Effect of Training to the Milking Parlour on the Behavioural Response to Milking and Milk production in First Lactation Heifers. *Proceedings of the New Zealand Society of Animal Production* 72: 134-138.
- Sutherland MA**, Davis BL, Brooks TA, Coetzee JF. 2012. The physiological and behavioral response of pigs castrated with and without anesthesia and/or analgesia. *Journal of Animal Science* 90: 2211-2221.
- Sutherland MA**, Bryer PJ, Davis BL, Smith JF, McGlone JJ. 2012. The combined effects of transport and food and water deprivation on the physiology of breeding age gilts. *Livestock Science* 144: 124-131.
- Sutherland MA** and Tucker C. 2011. The long and short of it: a review of tail docking in farm animals. *Applied Animal Behaviour Science* 135: 179-191.
- Sutherland MA**. 2011. Painful husbandry procedures and methods of alleviation: a review. *Proceedings of the New Zealand Society of Animal Production* 71: 189-194.
- Sutherland MA**, Davis BL, McGlone JJ. 2011. The effect of local or general anesthesia on the physiology and behavior of tail docked pigs. *Animal* 5: 1237-1246.
- Bryer PJ, **Sutherland MA**, Davis BL, Smith JF, McGlone JJ. 2011. The effect of transport and space allowance on the physiology of breeding age gilts. *Livestock Science* 137: 58-65.
- Sutherland MA**, Davis BL, Brooks TA, McGlone JJ. 2010. Physiology and behavior of pigs before and after castration: effects of two topical anesthetics. *Animal* 4: 2071-2079.
- Sutherland MA**, Bryer PJ, Davis BL, McGlone JJ. 2010. A multi-disciplinary approach to assess the welfare of weaned pigs during transport at three space allowances. *Journal Applied Animal Welfare Science* 13: 237-249.
- Sutherland MA**, Krebs N, Smith JS, Dailey J, Carroll, JA, McGlone JJ. 2009. The effect of three space allowances on the physiology and behavior of weaned pigs during transportation. *Livestock Science* 126: 183-188.

- Sutherland MA**, Shome GP, Hulbert, LE, Krebs N, Watchell M, McGlone JJ. 2009. Acute stress affects the physiology and behavior of allergic mice. *Physiology and Behavior* 98: 281-287.
- Sutherland MA**, Bryer PJ, Krebs N, McGlone JJ. 2009. The effect of tail docking method on tail biting behavior and welfare of pigs. *Animal Welfare* 18: 561-570.
- Sutherland MA**, McDonald A, McGlone JJ. 2009. Environmental, trailer, and gender effects on the percentage of dead and non-ambulatory pigs during transport. *Veterinary Record* 165: 13-18.
- Sutherland MA**, Bryer PJ, Davis BL, McGlone JJ. 2009. Space requirements of weaned pigs during a 60 minute transport in summer. *Journal Animal Science* 87: 363-370.
- Wachtel MA, Shome G, **Sutherland MA**, McGlone JJ. 2009. Derivation and validation for murine histologic alterations resembling asthma, with two proposed histologic grade parameters. *BMC Immunology* 10: 58
- Sutherland MA**, Bryer PJ, Krebs N, McGlone JJ. 2008. Tail docking in pigs: acute physiological and behavioral responses. *Animal* 2: 292-297.
- Sutherland MA**, Erlandson K, Connor JF, Salak-Johnson JL, Matzat P, Smith JF, McGlone JJ. 2008. Health of non-ambulatory, non-injured pigs at processing. *Livestock Science* 116: 237-245.
- Rudine AC, **Sutherland MA**, Hulbert L, Morrow JL, McGlone JJ. 2007. Diverse production system and social status effects on pig immunity and behavior. *Livestock Science*. 111: 86-95.
- Sutherland MA**, Niekamp SR, Johnson RW, Van Alstine WG, and Salak-Johnson JL. 2007. Heat and social rank impact behavior and physiology of PRRS-virus-infected pigs. *Physiology and Behavior* 90: 93-100.
- Niekamp SR, **Sutherland MA**, Dahl GE, and Salak-Johnson JL. 2007. Immune responses of piglets to weaning stress: Impacts of photoperiod. *Journal Animal Science* 85: 93-100.
- Niekamp SR, **Sutherland MA**, Dahl GE, and Salak-Johnson JL. 2006. Photoperiod influences the immune status of multiparous gestating sows and their piglets. *Journal Animal Science* 84:2072-2082.
- Sutherland MA**, Niekamp SR, Rodriguez-Zas SL, and Salak-Johnson JL. 2006. Impacts of chronic stress and social status on various physiological and performance measures in pigs of different breeds. *Journal Animal Science* 84:588-596.
- Sutherland MA**, Rodriguez-Zas SL, Ellis M, and Salak-Johnson JL. 2005. Breed and age affect baseline immune traits, cortisol, and performance in growing pigs. *Journal Animal Science* 83:2087-2095.
- Sutherland MA**, Mellor DJ, Stafford KJ, Gregory NG, Bruce RA, and Ward RN. 2002. Cortisol responses to dehorning of calves given a 5-hour local anesthetic regimen plus phenylbutazone, ketoprofen or adrenocorticotrophic hormone prior to dehorning. *Research Veterinary Science* 73:115-123.
- Sutherland MA**, Mellor DJ, Stafford KJ, Gregory NG, Bruce RA, and Ward RN. 2002. Effect of local anesthetic combined with wound cauterisation on the cortisol response to dehorning in calves. *Australian Veterinary Journal*. 80:165-168.
- Sutherland MA**, Stafford KJ, Mellor DJ, Gregory NG, Bruce RA, and Ward RN. 2000. Acute cortisol responses and wound healing in lambs after ring castration plus docking with or without application of a castration clamp to the scrotum. *Australian Veterinary Journal* 78:402-405.
- Sutherland MA**, Mellor DJ, Stafford KJ, Gregory NG, Bruce RA, Ward RN, and Todd SE. 1999. Acute cortisol responses of lambs to ring castration and docking after the injection of lignocaine into the scrotal neck or testes at the time of ring application. *Australian Veterinary Journal* 77:738-741.

Publications in preparation

- Sutherland M A**, Ballou MA, Davis BL, Brooks TA. The effect of castration and dehorning singularly or combined on the behavior and physiology of Holstein calves. *Journal of Animal Science* (submitted)

- Ballou MA, **Sutherland MA**, Brooks TA, Hulbert LE, Davis BL, Cobb CJ. Administration of local anesthetic and systemic analgesic prevent the suppressed innate immune responses observed following surgical castration and amputation dehorning in Holstein calves. *Veterinary Immunology and Immunopathology* (in preparation)
- Davis BL, **Sutherland MA**. The effect of repeated administration of exogenous glucocorticoids during late gestation in sows on the behaviour and physiology of the offspring during adolescence and modulation using Ketamine. *Applied Animal Behaviour Science* (Submitted)
- Sutherland MA**, Schütz KE. Effects of two bedding materials on the behaviour, cleanliness and thermoregulation of dairy calves. *Applied Animal Behaviour Science* (In preparation)

Book chapters

- Johnson, A. K., L. N. Edwards, S. R. Niekamp, C. Philips, **M. Sutherland**, S. Torrey, T. Casey-Trott, A. Tucker and T. Widowski. 2011. Chapter 3: Behavior and Welfare. In. *Swine Diseases*. John Wiley & Sons, Inc.

Other publications

- Sutherland MA**. 2011. Importance of behavioural responsiveness in New Zealand dairy cattle in regards to welfare. *Animal Welfare Pulse*, June 1st.
- Sutherland MA**. 2011. Pain relief helps stock and wallet. *Dairy News*, Feb 15th.
- Sutherland MA**. 2011. Find ways to ease calves' pain. *Dairy News*, Feb 8th.
- Sutherland MA**. 2010. Treat them nicely if you want more milk. *Dairy News*, Dec 14th.
- Sutherland MA** and Bryer PJ. 2010. Using carbon dioxide for on-farm euthanasia. *National Hog Farmer*, Dec 15th.
- Sutherland MA**, Krebs N, Smith JS, McGlone JJ. 2008. Transport space allowances studied for weaned pigs. *National Hog Farmer*, Dec 15th.
- Sutherland MA**, Bryer P, McGlone JJ. 2008. Alternative tail docking procedure cuts stress. *National Hog Farmer*, Dec 15th.
- Sutherland MA**, Smith JS, McGlone JJ. 2006. Data suggests foot, leg problems vary by packing plant. *National Hog Farmer*, Dec 15th: 27-28.
- Sutherland MA** and McGlone JJ. 2006. Temperature, humidity can take a toll on market hogs in transit. *National Hog Farmer*, Dec 15th: 28-29.
- Sutherland MA** and Stafford KJ. 1997. The fifth freedom: ability to display normal patterns of behaviour. *Vetscript* 2, pg2.
- Baumgartner, J., Bonneau, B., Boyle, L., Haugen, J.-E., Ten Napel, J., **Sutherland, M.**, Tuytens, F., Vanhonacker, F. Verbeke, W., 2011. Sub-report B – Welfare aspects of piglet castration. In: Spoolder, H., Bracke, M. Mueller-Graf, C. and Edwards, S. (eds), *Preparatory work for the future development of animal based measures for assessing the welfare of sow, boar and piglet including aspects related to pig castration*. Supporting Publications 2011:0178 [78 pp.]. Available online: <http://www.efsa.europa.eu/en/supporting/pub/178e.htm>
- Baxter, E., Boyle, L., Edwards, S., Geers, R., Harris, M., Meunier Salaun, M.-C., Juul-Pedersen, L., **Sutherland, M.**, Valros, A. and Wechsler, B., 2011. Sub-report A: Welfare of sow, boar and piglet. In: Spoolder, H., Bracke, M. Mueller-Graf, C. and Edwards, S. (eds), *Preparatory work for the future development of animal based measures for assessing the welfare of sow, boar and piglet including aspects related to pig castration*. Supporting Publications 2011:0178 [78 pp.]. Available online: <http://www.efsa.europa.eu/en/supporting/pub/178e.htm>

Abstracts

- Stewart M, **Sutherland MA**, Schütz KE. 2012. The effect of rearing calves on two different bedding materials: A comparison between river stones and sawdust. *Dairy Cattle Welfare Symposium*, Guelph, Canada.

- MA Sutherland** and Huddart FJ. 2012. The effect of training and milking familiarity on heifer behavioural reactivity to humans. Proceedings of the 46th International Congress of the International Society of Applied Ethology, Vienna, Austria.
- MA Sutherland**, Davis BL. 2011. Stress during gestation effects the growth, but not the stress response of the offspring. Proceedings of the Australasian Pig Science Association, Adelaide, Australia.
- MA Sutherland** and GA Verkerk. 2011. The effect of reactive state and training on the behaviour and milk production of heifers during the first week of lactation. J. Anim. Sci. 89 (Supp1):
- MA Sutherland** and GA Verkerk. 2011. The effect of reactive state and training on the behaviour and milk production of heifers during the first week of lactation. J. Anim. Sci. 89 (Supp1):
- MA Sutherland**, BL Davis, TA Brooks, MA Ballou. 2011. The effect of pain relief on the physiology and behavior of calves after castration and/or dehorning. J. Anim. Sci. 89 (Supp1):
- Davis BL, **MA Sutherland**, MA Ballou. 2011. The effect of prenatal stress and dominance order on immune function in response to a DTH and LPS challenge in pigs. J. Anim. Sci. 89 (Supp1):
- Davis BL and **MA Sutherland**. 2011. The effect of using carbon dioxide gas and/or a NSAID to reduce the pain associated with castration in pigs. J. Anim. Sci. 89 (Supp1):
- MA Ballou, **MA Sutherland**, BL Davis, TA Brooks, CJ Cobb, LE Hulbert. 2011. Physiological and immunological affects of surgical castration and amputation dehorning and the influence of anesthetics and analgesics in Holstein calves. J. Anim. Sci. 89 (Supp1):
- Kells NJ, Beausoleil N, Johnson CB, **Sutherland MA**. 2011. Assessment of the relative welfare impacts of three gas treatments for the euthanasia of suckling piglets. Humane Slaughter Association Centenary International Symposium, Portsmouth, UK.
- Sutherland MA**, Davis BL. 2010. The effect of anaesthesia and analgesia on the behaviour of piglets after castration. Proceedings of the 44th International Congress of the International Society of Applied Ethology, Uppsala, Sweden.
- Davis BL, **Sutherland MA**. 2010. The effect of a repeated prenatal stressor and low-dose Ketamine on the anxiety and social behavior of pigs. J. Anim. Sci. 88 (Supp1):
- Brooks TA, **Sutherland MA**, Davis BL, McGlone JJ. 2010. Comparison of different analgesic treatments to reduce the pain associated with tail docking in pigs. Proceedings of the 21st International Pig Veterinary Society Congress, Vancouver, USA.
- Bryer PJ, Davis BL, **Sutherland MA**, McGlone JJ. 2010. Emotional states of domestic and feral pigs. Integrative and Comparative Biology.
- Bryer PJ, **Sutherland MA**. Science based criteria for assessing humane euthanasia. 2010. Integrative and Comparative Biology.
- Sutherland MA**, Bryer PJ, Davis BL, Brooks TA, McGlone JJ. 2009. Comparison of novel methods to alleviate the pain caused by castration in pigs. Proceedings of the 43rd International Congress of the International Society of Applied Ethology, Cairns, Australia.
- Davis BL, Bryer PJ, **Sutherland MA**. 2009. The effect of fetal programming on offspring coping and cognition. Proceedings of the 43rd International Congress of the International Society of Applied Ethology, Cairns, Australia.
- Guay K, Brady H, Sutherland MA, Pond K, Janecka L, Allen V. 2009. Effects of a 24-Hour Transport on Stress Response in Horses. Equine Science Society, Keystone, CO, USA.
- Sutherland MA**, Bryer PJ, Davis BL, McGlone JJ. 2008. Space requirements of weaned pigs during transportation in summer. J. Anim. Sci. 86 (Supp1): 298.
- Sutherland MA**, Bryer PJ, Krebs N, McGlone JJ. 2008. A multi-disciplinary approach to assess the effect of tail biting on pig welfare. Proceedings of the 4th International Workshop on the Assessment of Animal Welfare at Farm and Group Level, Ghent, Belgium.
- Bryer PJ, **Sutherland MA**, Davis BL, Smith JF, McGlone JJ. 2008. The effect of 30-hour transport at two space allowances on physiological measures of stress in breeding gilts. J. Anim. Sci. 86 (Supp1): 298.

- Davis BL, **Sutherland MA**, Bryer PJ, Smith JF, McGlone JJ. 2008. Comparison of domestic and feral pig physiology, immunity and growth. *J. Anim. Sci.* 86 (Supp1): 458.
- McGlone JJ, **Sutherland MA**, Loneragan GH, Brashears M. 2008. Beef cattle welfare in the context of sustainable production systems. Proceedings of the international symposium on beef cattle welfare, Manhattan, KS.
- Sutherland MA**, Bryer P, Krebs N, McGlone JJ. 2007. Endocrine, hematological and behavioral stress responses to tail docking in pigs. *Cell Stress Chaperones* 12: 5H_07_P.
- Sutherland MA**, Krebs N, Hulbert LE, Smith JS, McGlone JJ. 2007. Space requirements of weaned pigs during transportation. *J. Anim. Sci.* 85 (Supp1): 386.
- Krebs N, **Sutherland MA**, McGlone JJ. 2007. Reducing stress at the packing plant using prior training and conditioning to odors in finishing pigs. *J. Anim. Sci.* 85 (Supp1): 19.
- McGlone JJ, Hulbert LE, Krebs N, **Sutherland MA**, Dailey JW. 2007. Major pitfalls in animal welfare research. *J. Anim. Sci.* 85 (Supp1): 546.
- Sutherland MA**, Krebs N, McGlone JJ. 2007. The effect of space allowance on behavior of weaned pigs during transportation. Proceedings of the 41st International Congress of the International Society of Applied Ethology, Merida, Mexico, pg 173.
- Krebs N, **Sutherland MA**, McGlone JJ. 2007. Can stress be decreased by exposure to odors or pheromones? Behavioral, immunological and physiological effects. Proceedings of the 41st International Congress of the International Society of Applied Ethology, Merida, Mexico, pg 81.
- Hulbert LE, Krebs N, Dailey JW, **Sutherland MA**, McGlone JJ. 2007. Nursery pig preference to floor types. Proceedings of the 41st International Congress of the International Society of Applied Ethology, Merida, Mexico, pg 206.
- McGlone JJ, **Sutherland MA**. 2007. Towards sustainable livestock production systems. Proceedings of the 7th Congress of the European Society for Agricultural and Food Ethics, Vienna, Austria, pp 223-228.
- Shome GP, Hulbert LE, Krebs N, **Sutherland MA**, Watchell M, McGlone JJ. 2007. Effect of forced swimming exercise stress on allergic pulmonary inflammation in mice. *J. Allergy and Clin. Immunol.* 119 (Supp): S292.
- Sutherland MA**, McDonald A, McGlone JJ. 2006. Factors influencing the percentage of dead and fatigued pigs during transport. Proceedings of the 19th International Pig Veterinary Society Congress, Copenhagen, Denmark, vol 2, pp 609.
- McGlone JJ, Erlandson K, Connor JF, Salak-Johnson JL, **Sutherland MA**, Matzat P. 2006. Health of non-ambulatory, non-injured pigs at processing. Proceedings of the 19th International Pig Veterinary Society Congress, Copenhagen, Denmark, vol 2, pg 617.
- Sutherland MA**, Niekamp SR, Van Alstine WG, and Salak-Johnson JL. 2005. Effects of stress on performance and the immune response in pigs infected with porcine reproductive and respiratory syndrome virus. *J. Anim. Sci.* 83 (supp 1):245
- Niekamp SR, **Sutherland MA**, and Salak-Johnson JL. 2005. Effects of weaning age on pig immune response to mixing stress. *J. Anim. Sci.* 83 (supp 1):352
- Niekamp SR, **Sutherland MA**, and Salak-Johnson JL. 2005. Long-term effects of weaning age on immune function in pigs. *J. Anim. Sci.* 83 (supp 1):350
- Niekamp SR, **Sutherland MA**, Dahl GE, and Salak-Johnson J L. 2005. Effects of photoperiod on immune function at three different weaning ages. *J. Anim. Sci.* 83 (supp 1):218
- Salak -Johnson JL, **Sutherland MA**, Horseman MJ, Rodriguez-Zas SL, and Niekamp SR. 2005. Effects of space on individual-and group-kept sows: behavior and immune status. *J. Anim. Sci.* 83 (supp 1):347
- Sutherland MA**, Niekamp SR, Rodriguez-Zas SL, and Salak-Johnson JL. 2004. Effects of stress and genotype on immune and cortisol measures in pigs. *J. Anim. Sci.* 82 (supp 1):458.
- Niekamp SR, **Sutherland MA**, Dahl GE, Auchtung TL, and Salak-Johnson J L. 2004. Effects of photoperiod on the immune function of multiparous gestating sows. *J. Anim. Sci.* 82 (supp 1):82.

Niekamp SR, **Sutherland MA**, Dahl GE, and Salak-Johnson JL. 2004. Effects of photoperiod on immune function in 7 and 21 day old piglets. J. Anim. Sci. 82 (supp 1):82.

Sutherland MA, Ellis M, and Salak-Johnson JL. 2003. Breed effects on immune and endocrine profile in growing pigs. J. Anim. Sci. 81 (supp 1):144.

Professional Memberships

American Society of Animal Science, 2002-present

International Society for Applied Ethology, 2007-present

American Dairy Science Association, 2011-present

Committee Membership

Animal care and use committee (Texas Tech University), 2007-2009