

J. A. D. Ranga Niroshan Appuhamy

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Education

- Ph.D. Animal Science.....(2010)**
Department of Dairy Science, College of Agriculture and Life Sciences,
Virginia Tech, Blacksburg, VA, USA
- M.Sc. Dairy Science.....(2006)**
Department of Dairy Science, College of Agriculture and Life Sciences,
Virginia Tech, Blacksburg, VA, USA
- M.Sc. Animal Science(2004)**
Post Graduate Institute of Agriculture, University of Peradeniya,
Peradeniya, Sri Lanka
- B.Sc. Agriculture.....(2000)**
Faculty of Agriculture, University of Peradeniya, Peradeniya,
Sri Lanka

Research Experience

- Post-doctoral Associate.....2012-continue**
Department of Animal Science, University of California, Davis, CA, USA
- Mathematical modeling for determining greenhouse gas emissions and nutrient excretions in fresh manure from lactating dairy cows
 - *In-vivo* experiments investigating nutritional and manure storage strategies aiming on minimizing enteric CH₄ emissions, and N and pathogen load in dairy manure
 - *In-vivo* experiments investigating effects of environmental temperature, and dietary nitrogen and mineral intake on body water kinetics of lactating dairy cows

- Post-doctoral Associate.....2010-2011**
Center for Nutrition Modeling, Department of Animal and Poultry Sciences, University of Guelph, Guelph, ON, Canada
- Mathematical modeling of type 2 diabetes prevalence and incidence with respect to associations between lifestyle interventions and diabetes biomarkers
- Research Assistant (Ph.D. program).....2007-2009**
Department of Dairy Science, College of Agriculture and Life Sciences, Virginia Tech, Blacksburg, VA, USA
- Dissertation title: Regulatory roles of essential amino acids, energy, and insulin in mammary cell protein synthesis
- Research Assistant (M.Sc. program).....2005-2006**
Department of Dairy Science, College of Agriculture and Life Sciences, Virginia Tech, Blacksburg, VA, USA
- Theses title: Genetic and phenotypic relationships of lactation persistency to common health disorders among lactating dairy cows

Teaching Experience

- Assistant Lecturer.....2000-2001**
Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka
- Lecturer.....2001-2004**
Department of Livestock and Avian Sciences, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Sri Lanka
- Teaching Assistance2006-2009**
- **Dairy Genetics and Breeding**
 - **Applied Dairy Nutrition**
- Department of Dairy Science, Virginia Tech, Blacksburg, VA, USA
- Instructor (Mathematical Modeling in Biological Systems).....2013-2014**
Department of Animal Science, University of California, Davis, USA
- Guest Lecturer (Sustainable Animal Agriculture).....2012-2013**
Department of Animal Science, University of California, Davis, USA

Awards & Honors

- ❖ The second runner-up, Ph.D. student poster competition at ADSA/ASAS joint meetings, Québec, Canada (2009)
- ❖ Travel Fund Program (TFP) award - Graduate student assembly, Virginia Tech, Blacksburg, 24061 VA (2009)
- ❖ David W. Francis and Lillian Francis Tuition Scholarship - College of Agriculture and Life Sciences, Virginia Tech, Blacksburg, 24061 VA (2007)
- ❖ Outstanding MS thesis award - Sigma-Xi chapter at Virginia Tech, Blacksburg, 24061 VA (2006)
- ❖ Nominee – Japanese Government Mombukagakusho Scholarship – Japanese Embassy, Colombo, Sri Lanka (2004)
- ❖ Nominee-Commonwealth Scholarships for Graduate Studies, Commonwealth Scholarships and Fellowship Plan (CSFP), University Grant Commission, Sri Lanka (2003)
- ❖ Outstanding undergraduate student specializing in Animal Science – Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Sri Lanka (2000)

Publications

Peer-reviewed Journal Articles

- ❖ **Appuhamy, J. A. D. R. N.**, L. E. Moraes, C. Wagner-Riddle, D. P. Casper, J. France, E. Kebreab. **2014**. Development of mathematical models for determining volume and nutrient composition of fresh manure from Lactating Holstein Dairy Cows. *Anim. Prod. Sci.* 54:1927-1938
- ❖ **Appuhamy, J. A. D. R. N.**, C. Wagner-Riddle, D. P. Casper, J. France, E. Kebreab. **2014**. Quantifying body water kinetics and fecal and urinary water output from lactating Holstein dairy cows. *J. Dairy Sci.* 97: 6177-6195
- ❖ Bougouin A, **J. A. D. R. N. Appuhamy**, E. Kebreab, J. Dijkstra J, R. P. Kwakkel, J. France. **2014**. Effects of phytase supplementation on phosphorus retention in broilers and layers: A meta-analysis. *Poult. Sci.* 93(8):1981-92

- ❖ **Appuhamy J. A. D. R. N.**, W. A. Nayananjalie, E. M. England, D. E. Gerrard, R. M. Akers, and M. D. Hanigan. **2014**. Effects of AMP-activated protein kinase (AMPK) signaling and essential amino acids on mammalian target of rapamycin (mTOR) signaling and protein synthesis rates in mammary cells. *J. Dairy Sci.* 97(1):419-29
- ❖ **Appuhamy, J. A. D. R. N.**, A. B. Strathe, S. Jayasundara, C. Wagner-Riddle, J. Dijkstra, J. France, E. Kebreab. **2013**. Anti-methanogenic effects of monensin in dairy and beef cattle: a meta-analysis. *J. Dairy Sci.* 96(8):5161-73
- ❖ **Appuhamy, J. A. D. R. N.**, E. Kebreab, and J. France. **2013**. A mathematical model for determining age-specific diabetes incidence and prevalence using body mass index. *Ann. Epidemiol.* 23(5):248-54
- ❖ Hanigan, M. D., **J. A. D. R. N. Appuhamy**, and P. Gregorini. **2013**. Revised digestive parameter estimates for the Molly cow model. *J. Dairy Sci.* 96(6):3867-85
- ❖ **Appuhamy, J. A. D. R. N.**, N. A. Knoebel, W. A. Deepthi Nayananjalie, Jeffery Escobar, and Mark D. Hanigan. **2012**. Isoleucine and leucine independently regulate mTOR signaling and protein synthesis in MAC-T cells and bovine mammary tissue slices. *J. Nutr.* 142(3):484-491.
- ❖ **Appuhamy, J. A. D. R. N.**, A.L. Bell, W. A. Deepthi Nayananjalie, Jeffery Escobar, and Mark D. Hanigan. **2011**. Essential amino acids regulate both initiation and elongation of mRNA translation independent of insulin in MAC-T cells and bovine mammary tissue slices. *J. Nutr.* 141(6):1209-15.
- ❖ **Appuhamy, J. A. D. R. N.**, J. R. Knapp, O. Becvar, J. Escobar, M. D. Hanigan. **2011**. Effects of jugular-infused lysine, methionine, and branched-chain amino acids on milk protein synthesis in high producing dairy cows. *J. Dairy Sci.* 94(4):1952-60.
- ❖ Rius A. G., **J. A. D. R. N. Appuhamy**, J. Cyriac, D. Kirovski, J. Escobar, M. C. McGilliard, B. J. Bequette, R. M. Akers, and M. D. Hanigan. **2010**. Regulation of protein synthesis in mammary glands of lactating dairy cows by starch and amino acids. *J. Dairy Sci.* 93(7):3114-27
- ❖ **Appuhamy, J.A.D.R.N.**, B.G. Cassell, and J.B. Cole. **2009**. Phenotypic and genetic relationships between common health disorders and milk and fat yield persistencies from producer recorded health data and test day yields. *J. Dairy Sci.* 92: 1785-95
- ❖ Toshniwal J. K., C. D. Dechow, B. G. Cassell, **J. A. D. R. N. Appuhamy**, G. A. Varga. **2008**. Heritability of electronically recorded daily body weight and correlations with yield, dry matter intake, and body condition score. *J. Dairy Sci.* 8:3201-10

- ❖ **Appuhamy, J.A.D.R.N.**, B.G. Cassell, C.D. Dechow, and J.B. Cole. **2007**. Phenotypic relationships between common health disorders in dairy cows to lactation persistency estimated from daily milk weight. *J. Dairy Sci.* 90:4424-34.

Peer-reviewed Conference Proceedings

- ❖ **Appuhamy, J. A. D. R. N.** and M. D. Hanigan. **2010**. Modeling the effects of insulin and amino acids on the phosphorylation of mTOR, Akt, and 4EBP1 in mammary cells. IN: Modeling nutrient digestion and utilization in farm animals (D. Sauvant, J. Van Milgen, P. Faverdin and N. Friggens). pp 225-232. Wageningen Publishers, Wageningen, The Netherlands.

Peer-reviewed Abstracts

- Fernandez, C., **J. A. D. R. N. Appuhamy**, J. G. Fadel, E. Kebreab. 2014. Mechanistic model for quantifying nitrogen excretions from Mediterranean dairy goats. Proceedings of 8th International Workshop on Modelling Nutrient Digestion and Utilization in Farm Animals; September 15-17, Cairns, Australia.
- **Appuhamy, J. A. D. R. N.**, E. Kebreab, J. France. 2013. A mechanistic model for estimating water excretion in dairy cows. *J. dairy Sci.* Vol. 96., Suppl.1: 710
- **Appuhamy, J. A. D. R. N.**, J. France. 2011. A generic mathematical model for predicting disease prevalence and incidence with reference to diabetes. *Can. J. Anim. Sci.*, 91: 717
- Evans, E. K., **J.A.D.R.N. Appuhamy**, and M. D. Hanigan. 2010. The effects of leptin on phosphorylation of mTOR and rpS6 to signal protein synthesis in bovine mammary epithelial cells. *J. Dairy Sci.* Vol. 93, Suppl. 1: 390
- **Appuhamy, J.A.D.R.N.**, T. R. Wiles, and M. D. Hanigan. 2010. Regulatory effects of individual essential amino acids on casein synthesis rates in bovine mammary tissue slices. *J. Dairy Sci.* Vol. 93, Suppl. 1: 682
- **Appuhamy, J.A.D.R.N.**, J. Escobar, and M. D. Hanigan. 2010. Effects of glucose and essential amino acids on phosphorylation of signaling proteins for protein synthesis in bovine mammary epithelial cells. *J. Dairy Sci.* Vol. 93, Suppl. 10: 549
- **Appuhamy, J.A.D.R.N.**, C. Bray, J. Escobar and M.D. Hanigan. 2009. Effects of acetate and

essential amino acids on protein synthesis signaling in bovine mammary epithelial cells in-vitro. J. Dairy Sci. 92, Suppl. 1:44.

- **Appuhamy J. A. D. R. N.**, J.R. Knapp, C. Umberger, M. D. Hanigan. 2009. Effects of jugular-infused branched-chain amino acid supplementation on milk protein synthesis in high producing dairy cows. J. Dairy Sci. 92, Suppl. 1: 151-152
- Bell, A. L., **J. A. D. R. N. Appuhamy**, J. Escobar, and M.D. Hanigan. 2009. Insulin and essential amino acids have significant but independent effects on protein synthesis signaling in bovine mammary epithelial cells *in-vitro*. J. Dairy Sci. 92, Suppl. 1: 472.
- Cyriac, J., A.G. Rius, **J.A.D.R.N. Appuhamy**, R.E. Pearson, J.H. Herbein, K.F. Knowlton, J.L. Firkins, and M.D. Hanigan. 2009. Varying ruminally degradable protein concentrations in the lactating dairy cow diets maintains rumen fiber digestion and outflow of nutrients. J. Anim. Sci. Vol. 87, Suppl. 2: 99
- **Appuhamy, J.A.D.R.N.**, M.D. Hanigan and J. Escobar. 2009. Effects of amino acids on phosphorylation of S6 ribosomal protein in mammary epithelial cells in-vitro. The FASEB Journal 23:738.13.
- **Appuhamy, J. A. D. R. N.**, and M. D. Hanigan. 2008. Ruminal starch, fiber, and protein digestion parameter estimates for Molly. Can. J. Animal Sci 88: 730.
- Ruis, A. G., **J. A. D. R. N. Appuhamy**, D. Kirovoski, J. Cyriac, and M. D. Hanigan. 2008. Effect of starch and casein infusions in the abomasum of lactating dairy cows. J. Dairy Sci. 91Suppl. 1: 123.
- **Appuhamy, J. A. D. R. N.**, and M. D. Hanigan. 2007. Accommodating experimental bias due to fixed effects when estimating model parameters in the ACSL framework. Can. J. Animal Sci 87: 647
- **Appuhamy, J. A. D. R. N.**, B. G. Cassell, J. B. Cole, 2006, Effect of mastitis and postpartum metabolic diseases on milk yield persistency of Holstein and Jersey cows, J. Dairy Sci. 89 Suppl 1:398.

Peer Reviewer

Journal of Dairy Research..... (2010)
Journal of dairy science.....(2014)
CAB reviews(2014)

Technical Skills

In-vivo and in-vitro experimentation

- ❖ Diet formulation for Dairy cows
- ❖ Dairy cow handling and training with Calan-gate feeding system
- ❖ Rumen evacuation and omasal sampling for dairy cows
- ❖ Omasal infusions of nutrients (starch and casein)
- ❖ Jugular catheterization of dairy cows
- ❖ Jugular infusions of nutrients (amino acids) to dairy cows
- ❖ Blood sample collection from Jugular vein and coccygeal vessels of dairy cows
- ❖ Conducting metabolic trials for total collection method with dairy cows
- ❖ Measuring enteric CH₄ emissions from dairy cows using the Greenfeed system
- ❖ Collecting mammary biopsies from lactating dairy cows
- ❖ Preparing mammary tissue slices from lactating dairy cows
- ❖ Maintaining bovine mammary cell cultures
- ❖ Harvesting and preparing cell lysates from mammary biopsies, tissue slices and cell cultures for intracellular nutrient analysis and signaling protein analyses
- ❖ Commendable experiences on Western Immunoblotting methodology
- ❖ Analyses of amino acid concentrations in blood plasma and cell lysates with stable isotopic dilution using gas-chromatography and mass spectrometry (GC-MS)

Mathematical modeling

- ❖ Experimental design and data analyses with SAS and R
- ❖ Linear and non-linear fixed-effect model analysis with SAS and R
- ❖ Linear and non-linear mixed-effect model analysis with R
- ❖ Mechanistic and dynamic model development and simulation with ACSL and R
- ❖ Mechanistic and dynamic model optimization with ACSL