

# ANIMAL PRODUCTION SCIENCE

**CONTENTS** Volume 61, Issue 7, 2021, 621–720

## Review

Zinc supplementation improves growth performance in small ruminants: a systematic review and meta-regression analysis

*J. C. Angeles-Hernandez, M. Miranda, A. L. Muñoz-Benitez, R. Vieyra-Alberto, N. Morales-Aguilar, E. A. Paz and M. Gonzalez-Ronquillo* 621–629

## Genetics and Genomics

Discovery of single nucleotide polymorphisms in bone morphogenetic protein (*BMP*) genes of goats by double digest restriction-site associated DNA sequencing

*Shalu Elizabeth Simon, G. Radhika, T. V. Aravindakshan, Marykutty Thomas and K. Raji* 630–636

## Water, Feed Quality and Metabolism

Water quality and management in the Australian pig industry

*Louise Edwards and Helen Crabb* 637–644

*In vitro* fermentation characteristics of tropical legumes and grasses of good and poor nutritional quality and the degradability of their neutral detergent fibre

*J. M. Castro-Montoya, K. Goetz and U. Dickhoefer* 645–654

Effects of duration of betaine supplementation on growth performance and blood IGF-1 in light- and normal-weight weaner pigs under commercial conditions

*Fan Liu, Erin M. Ford, Chris J. Brewster, David J. Henman and Robert J. Smits* 655–661

Calcitic seaweed (*Lithothamnion calcareum*) as an organic source of calcium in piglet feeding

*Liliana Bury de Azevedo dos Santos, Jansller Luiz Genova, Paulo Levi de Oliveira Carvalho, Paulo Evaristo Rupolo and Silvana Teixeira Carvalho* 662–672

## Behaviour, Well-being and Health

Shortening the immunocastration-to-slaughter interval from 3 to 2 weeks reduced carcass backfat and weight, increased sexual behaviour and carcass skin blemishes in group-housed male pigs sold at fixed age

*Fan Liu, Rebecca S. Morrison, Amy K. Lealiifano, Chris J. Brewster, David J. Henman and Robert J. Smits* 673–679

## Production Systems, Environment and Management

Analysis of culling reasons and age at culling in Australian dairy cattle

*Zewdie Wondatir Workie, John P. Gibson and Julius H. J. van der Werf* 680–689

Dietary condensed tannins in bovine faeces and effects on soil microbial dynamics: are there environmental benefits for cattle production systems?

*Gisele M. Fagundes, Gabriela Benetel, Mateus M. Carriero, Ricardo L. M. Sousa, Kelly C. Santos, James P. Muir and Ives C. S. Bueno* 690–697

## Production Systems in Transition

Herbaceous legumes provide several options for increasing beef cattle productivity in eastern Indonesia

*Dianne Mayberry, Debora Kana Hau, Philip Rido Dida, Dionisius Bria, Jefrianus Praing, Agustinus Dule Mata, Esnawan Budisantoso, Neal Dalgliesh, Simon Quigley, Lindsay Bell and Jacob Nulik* 698–707

## Wool, Meat and Technology

Preliminary comparison of skin transcriptome from sheep with different wool fibre diameters

*Yunxia Qi, Shaoyin Fu, Xiaolong He, Biao Wang, Lai Da, Rigele Te, Ma Yuejun, Sun Suzhen, Wenguang Zhang and Yongbin Liu* 708–714

Chemical lean determination of boneless beef and lamb using a halogen moisture analyser

*Peter Watkins* 715–720