



World Congress on Oils and Fats & 28th ISF Congress

27 - 30 September 2009 • Sydney Australia

oils and fats essential for life
program & abstract book



www.isfsydney2009.com

Hosted by



PO115

USING GARLIC OLEORESIN TO MODIFY THE FLAVOUR OF PORK - FROM THE PERSPECTIVE OF SINGAPORE AND NEW ZEALAND CONSUMERS

Leong J^{1,2}, Purchas RW², Morel PCH², Wilkinson BHP²

¹Singapore Polytechnic, School of Chemical and Life Sciences, 500, Dover Road, Singapore 139651, Singapore Polytechnic

²Massey University, Institute of Food, Nutrition and Human Health, PN 452, Private Bag 11 222, Palmerston North, New Zealand

Sensory quality is an important consideration when Singapore consumers purchase pork. They often associate non-Indonesian pork with the presence of an unpleasant off-flavour described as a mutton-like flavour. Some evidence indicates that the intensity of undesirable flavours in meat can be reduced by herbs and spices. The current experiments assessed the possibility of reducing mutton flavour in pork and improving its acceptability by adding garlic oleoresin. The threshold level for aroma of garlic oleoresin when added to rice bran oil or minced pork was determined. For cooked pork mince the threshold for garlic taste was also assessed, along with levels of mutton aroma and taste, and acceptability. Singapore and New Zealand panellists were used.

The concentration at which aroma of garlic oleoresin could be detected by Singaporean (n=50) and New Zealand (n=49) consumers in rice-bran oil, and in either raw or cooked pork mince (n=30 for Singaporean consumers and n=50 for New Zealand consumers) was assessed using a threshold test protocol. Most panellists in Singapore (80%) and New Zealand (75%) could detect garlic aroma in rice bran oil at a concentration at 75 ppm. Increased garlic oleoresin concentration in rice bran oil had a positive influence on garlic aroma intensity (p<0.05) for Singapore and New Zealand panellists, and also on garlic aroma hedonic scores for Singapore consumers only (p<0.05). For cooked pork mince, panellists detected significant differences in garlic (p<0.0001) and mutton (p<0.0001) aroma intensity with increasing levels of garlic oleoresin (0 to 175 ppm), but the degree of liking of garlic aroma did not change significantly. A garlic oleoresin concentration of 100 ppm in pork mince significantly increased the intensity of garlic aroma and reduced the mutton aroma in raw and cooked pork samples. To significantly reduce mutton taste in pork mince, a garlic oleoresin concentration of 125 ppm was needed. Increases in the intensity of garlic aroma and taste were associated with increases in acceptability of cooked-mince garlic taste to a greater extent for Singapore panellists than New Zealand panellists. It is concluded that undesirable mutton-like flavour notes in pork mince may be reduced by adding garlic oleoresin.

PO116

GROWTH RESPONSES OF LACTATING FIRST-PARITY DAIRY COWS TO CANOLA AND LUPIN SUPPLEMENTATION

Chiu YF¹, Jones D², Nichols P³, Malau-Aduli AEO¹

¹University of Tasmania, Hobart, Australia

²Willowdene Dairy Farm, Hamilton, Tasmania, Australia

³CSIRO Marine and Atmospheric Research, Hobart, Tasmania, Australia

The effect of supplementing young, first-parity dairy heifers in mid-lactation with canola meal and cracked lupins on growth traits was investigated. The objective was to evaluate body condition scores (BCS), liveweight (LWT) and average daily gain (ADG) responses in purebred Holstein-Friesian and Holstein-Friesian x Jersey crossbreds and to ascertain variation due to breed, supplement and feeding level. A 2 x 2 x 2 balanced factorial experimental design representing 2 breeds, 2 supplements and 2 feeding levels (1 or 2 kg/cow/day) was utilized in randomly allocating fifty (10 unsupplemented control and

40 supplemented) cows to treatment groups after balancing for LWT, BCS and days in milk. All cows had *ad libitum* access to ryegrass pasture and barley and had a 3-week adjustment period to the supplements. The feeding trial lasted for 12 weeks commencing from October 2008 and ending in February 2009. LWT and BCS measurements were taken monthly. Average daily gain was computed and all data statistically analysed using mixed models procedure in SAS. Our results demonstrated that Holstein-Friesian cows gained 10kg more LWT than Holstein-Friesian x Jersey crossbreds and 20kg more than the unsupplemented cows at the end of the experiment. In all breeds, liveweight increased from 352kg in October, reached a peak in January and began to decline in February. BCS followed a similar pattern rising from an initial score of 2.5 to 3.5 in all breeds with the Holstein-Friesian in better condition than the crosses and control group. In contrast to LWT, ADG declined from an initial 0.6kg/day in October to 0.0kg/d in February in Holstein-Friesian while the unsupplemented cows lost weight as the feeding trial progressed. It was clearly demonstrated that the highest responses in ADG and LWT were in cows fed canola at 1kg/cow/day closely followed by 2kg/cow/day of lupins. In conclusion, supplementing mid-lactation dairy cows with canola elicits a better LWT and ADG response than lupins. Also, supplementing at 1kg/cow/day is cheaper and triggers the same response as 2kg/cow/day. Supplementation would be beneficial in maintaining liveweight and good body condition for better conception rates in young breeding cows.

PO117

MILK YIELD OF HOLSTEIN-FRIESIAN AND JERSEY X HOLSTEIN-FRIESIAN COWS SUPPLEMENTED WITH CANOLA MEAL AND CRACKED LUPINS

Malau-Aduli AEO¹, Chiu YF¹, Jones D², Nichols PA³

¹University of Tasmania, Hobart, Australia

²Willowdene Dairy Farm, Hamilton, Tasmania, Australia

³CSIRO Marine and Atmospheric Research, Hobart, Tasmania, Australia

Milk yield is a key selection trait in dairy cows. During the course of lactation, milk yield follows a typical curvilinear pattern characterized by an initial increase immediately after calving, a rise to peak before an eventual decline. Cows in mid-lactation are typically in the decline phase and would require supplementation to ensure persistency in milk yield, particularly during summer when pasture availability is limited. This study evaluated the milk yield responses of purebred and crossbred dairy cows to two levels (1 or 2 kg/cow/day) of canola meal or cracked lupins supplementation in a pasture-based production system. Fifty Holstein-Friesian (HF) and Jersey x Holstein-Friesian (JHF) dairy cows (10 unsupplemented control and 40 supplemented) were randomly assigned to treatment groups after balancing for initial milk yield, BCS and days in milk (mean initial milk yield, body weight and body condition scores were 122.5 ± 12.1 litres/d, 352.6 ± 31 kg, and 2.5 respectively). A 2 x 2 x 2 balanced factorial experimental design representing 2 breeds, 2 supplements and 2 feeding levels was utilized. All cows had *ad libitum* access to the basal diet of barley and ryegrass while supplemented cows had three weeks of adjustment before the 12 weeks of feeding trial commenced. All cows were milked twice daily and milk yield individually recorded automatically at milking. Data were tested for significance by fitting the fixed effects of breed, supplement, feeding level and their first order interactions using mixed model procedures in SAS with cow and days in milk as random effects. Overall differences between treatment means were declared significant at P<0.05. Milk yield at all times was significantly higher in supplemented than unsupplemented cows with the rate of decline in milk yield faster in unsupplemented cows. For ten consecutive weeks, supplementing with lupins elicited a better milk yield response than with canola but breed differences between purebred and crossbred cows were not significant (P>0.26).

Supplementing with lupins at 1kg/cow/day gave the best milk yield response and would be a far cheaper option for supplementing mid-lactation cows than canola.

PO118

MILK COMPOSITION AND SOMATIC CELL COUNTS IN PASTURE-BASED DAIRY COWS SUPPLEMENTED WITH CRACKED LUPINS AND CANOLA MEAL

Malau-Aduli AEO¹, Chiu YF¹, Jones D², Nichols PA³

¹University of Tasmania, Hobart, Australia

²Willowdene Dairy Farm, Hamilton, Tasmania, Australia

³CSIRO Marine and Atmospheric Research, Hobart, Tasmania, Australia

The price paid to dairy farmers on the basis of protein and butterfat is higher than milk volume averaging \$9.31/kg of protein and \$4.98/kg of butterfat compared to 49.69 cents/litre of milk. Supplementing lactating dairy cows with protein and energy sources such as canola and lupins could be a key income driver, but what feeding level is considered optimal for milk composition in pasture-based dairy cows in mid-lactation? This study evaluated the protein, fat, lactose, solids-not-fat and somatic cell counts of purebred and crossbred dairy cows fed 1 or 2 kg/cow/day of cracked lupins supplements or canola meal over a 12-week period. Fifty Holstein-Friesian (HF) and Jersey x Holstein-Friesian (JHF) dairy cows (10 unsupplemented control and 40 supplemented) were randomly assigned to treatment groups after balancing for initial milk yield, BCS and days in milk (mean initial milk yield, body weight and body condition scores were 122.5 ± 12.1 litres/d, 352.6 ± 31 kg, and 2.5 respectively). A 2 x 2 x 2 balanced factorial experimental design representing 2 breeds, 2 supplements and 2 feeding levels was utilized. All cows had *ad libitum* access to the basal diet of barley and ryegrass while supplemented cows had three weeks of adjustment. All cows were milked twice daily but milk samples for composition analysis was taken once a month and analysed at TasHerd milk testing laboratory in Hadspen, Tasmania. Data were tested for significance by fitting the fixed-effects of breed, supplement, feeding level and their first order interactions using mixed model procedures in SAS with cow and days in milk as random effects. Overall differences between treatment means were declared significant at $P < 0.05$. Protein, fat and somatic cell counts were significantly higher in JHF crossbreds than purebred HF, while breed differences in solids-not-fats were negligible. Supplementing with lupins at 1kg/cow/day led to a significantly low milk fat content (1.2%), low somatic cell count (97) but high protein content (3.4%) while canola fed at 2kg/cow/day gave the highest milk lactose content. The overall cheaper and more profitable option for optimal milk composition appears to be cracked lupins fed at 1kg/cow/day.

PO119

PROTEINS AS PART OF NUTRITIONAL ASPECT

Mushongo N

Ndola Nutrition Group

A study on Proteins on the Copperbelt, in Ndola District was undertaken to investigate the influence on the use Protein meals as supplements. The overall objective of the study was to provide an overall understanding of Proteins as part of the nutritional aspect. Protein is needed for all cells in our body that is (Growing and Repairing). Proteins contains the elements Carbon, Hydrogen, Oxygen, Nitrogen, usually Sulphur and possibly, others according to their source. Examples of foods containing Protein are lean meat, eggs, beans, fish and milk and its products such as cheese. Data were collected between June and August 2008 using 20 people feed on balanced meals mostly on foods containing Proteins. The study

revealed that a diet, with a sufficient energy content of *Fats* and *Carbohydrates* and rich in vitamins and salts will lead to illness and death because of its lack of Proteins. Proteins are particularly important during periods of pregnancy and growth when new cytoplasm cells and tissues are being made. Proteins are also needed for the babies especially those with, to start with 6 months by adding to their porridge, besides the mothers milk. People who work hard requires more Proteins and those who have been ill need more Proteins to replace the broken down cells. Proteins can build all the Amino acids they need from *carbohydrates*, *nitrates* and *sulphates*, but animals cannot. They must therefore, obtain their Amino acids from Proteins already made by plants or Proteins in other animals and the diet must therefore, include a minimum quantity of Proteins of one sort or another. Animal Proteins generally contain more essential Amino acids than do plants, proteins, but since *milk* and *eggs* contains the proportion of all. a vegetarian who includes these in his diet should not lack essential Amino acids. The results therefore suggest, that if *Proteins* are eaten in excess, there will be Amino acids in the body than are needed to produce or replace cells. The excess Amino acids are converted in the *liver* to *carbohydrates*, which then oxidize for energy, or converted to glycogen and stored. The information generated is beneficial and would help, as a knowledge base and tool for planning and for formulation of management models to sustainable on human healthy particularly, Proteins.

PO120

RELATIVE FEED VALUE OF MASSAI GRASS ENSILED WITH PEANUT KERNEL CAKE FROM BIODIESEL INDUSTRY

Lima LS¹, Oliveira RL¹, Borja MS¹, Bagaldo AB², Ribeiro CVDM¹, Bezerra LS¹, Barros JMN¹, Rosa SS¹, Santos AS¹

¹Universidade Federal da Bahia, Salvador, Brasil

²Universidade Federal do Recôncavo da Bahia, Cruz das Almas, Brasil

Tropical grass silage may have high moisture content, causing inadequate fermentation and loss of nutrients through the effluent. The reduction of moisture can be done by adding absorbent additives to the silage. The byproducts of biodiesel industry may be used in animal nutrition, such as peanut cake originated from oil seed extraction. The index value of Massai grass ensiled with 4 concentrations (0, 8, 16, and 24%) of peanut cake was evaluated. The index value of the forage was estimated based on the concentration of silage NDF and ADF. The data was analyzed as a completely randomized design, with four treatments and four replicates per treatment. The silage index value observed with the addition of 0, 8, 16, and 24% of peanut cake were 70.0, 91.7, 103.2, and 124.0, respectively. There was a linear response ($Y = 71.20 + 2.17x$; $R^2 = 0.99$) to the silage index value with the addition of peanut cake to the silage. Peanut cake addition above 16% to grass silage may increase forage index value comparable to alfalfa hay. Other parameters, such as economic evaluation, should be considered to determine the maximum level of inclusion of peanut cake to Massai grass silages.

PO121

THERMAL COMFORT INDEX AND PHYSIOLOGICAL PARAMETERS OF CROSSBRED BOER GOATS FED SUNFLOWER CAKE FROM BIODIESEL INDUSTRY

Ribeiro RDX¹, Oliveira RL¹, Aly Agy MSF^{1,2}, Ribeiro MD³, Ribeiro CVDM¹, Silva TM¹, Bagaldo AR⁴, Rosa SS¹

¹Universidade Federal da Bahia, Salvador, Brasil

²Instituto de Investigação Agrária do Moçambique, Maputo, Moçambique

³Universidade Federal do Mato Grosso, Cuiabá, Brasil