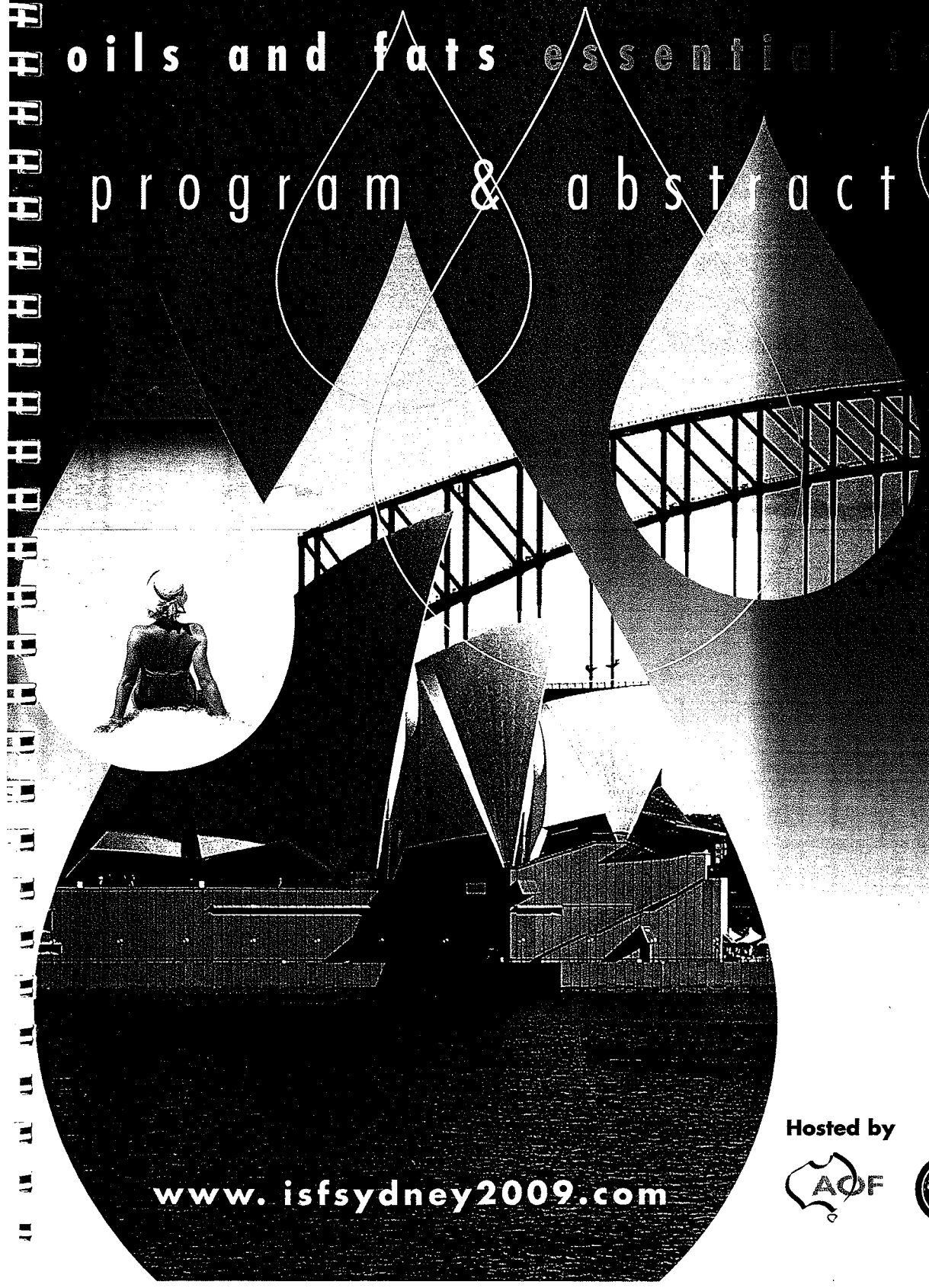
# World Congress on Oils and Fats & 28th ISF Congress

27 - 30 September 2009 • Sydney Australia

oils and fats essential for life

# program & abstract book



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# Welcome

Welcome to World Congress on Oils and Fats and 28th ISF Congress, 2009. We have developed the Congress based on previous ISF programs encompassing the wide range of topics associated with edible fats and oils. A major addition has been several pre- and post-Congress workshops available to delegates covering deep frying, lipid oxidation and olive oil. This has allowed us to maximise the amount of technical information from the Congress in the brief period of time available.

I wish to welcome both local and international speakers. This broad group encompasses experts with many research interests as well as experts from industry who will provide delegates with an unlimited resource to further their understanding of lipids in almost any topic. Hopefully, new and old associations will lead to information and even future collaborations to help further scientific knowledge on lipids.

A symposium will be held on the last day which is focused on olive oil, diversity, quality and authenticity. Everybody is invited to attend and contribute and learn about the intricacies of olive oil. This will provide an opportunity to cover areas not discussed in the main body of the program.

I would like to thank our sponsors for making this Congress possible. The Australian Oilseed Federation, the Australian Olive Association and the large number of industries that took part have helped ensure the Congress will provide positive outcomes for everybody.

Thank you to the Organising Committee who designed the Congress and contributed personal time and expenses to make it happen. I also thank the Technical Committee who provided the input into program design, reviewing papers and posters and advice on the technical operations of the Congress. The time required of these busy people is significant and their contribution here has been invaluable and greatly appreciated.

This Congress is an opportunity to talk to many of the world's leading specialists and experts on all topics of lipid science. I encourage delegates to utilise these few days to gain from others and to share your knowledge. I hope that the Congress fulfils your expectations.

With best wishes

**Dr Rodney Mailer**
**Congress Chairman**

# Committees

## Congress Organising Committee

Dr Rodney Mailer – Industry and Investment NSW – Wagga Wagga Research Institute
*Congress Chairman*

Nick Goddard – Australian Oilseeds Federation

Lucky Inturrisi – Cargill Australia Ltd

Paul Miller – Australian Olive Association

Rosemary Richards – Bowman Richards & Associates

John Slee – Aus-Oils Pty Ltd

## Congress Technical Committee

### Olive Oil

Leandro Ravetti – Modern Olives (Australia)
Lanfranco Conte – University di Udine (Italy)

### Health and Nutrition

Andrew Sinclair – Deakin University (Australia)
Manohar Garg – University of Newcastle (Australia)
Sebastiano Banni – Università degli Studi di Cagliari (Italy)
Barbara Eden – Heart Foundation (Australia)

### Biodiesel

Kerr Walker – Merrystem Consultants Ltd (UK)
Elaine Booth – Scottish Agricultural College (UK)
Adrian Carpenter – Biodiesel Consultant (Australia)
Warwick Rush – Gardner Smith (Australia)

### Aquaculture

Peter Nichols – CSIRO Marine Research (Australia)
Chris Carter – University of Tasmania (Australia)

### Biotechnology

Greg Buzza – Nufarm (Australia)
Phillip Salisbury – University of Melbourne (Australia)
Allan Green – CSIRO Plant Industry (Australia)

### Processing

Neoh Soon Bin – Soon Soon Group (Malaysia)
JS Rao – Riverland Oilseed Processors (Australia)

### Lipid Chemistry

Laurence Eyres – The University of Auckland (New Zealand)
Rod Smith – Food Sciences Australia (Australia)

### Oleochemicals

JS Rao – Riverland Oilseed Processors (Australia)
Mike Newton – Consultant (Australia)

### Animal Meal and Nutrition

Edward Clayton – Industry and Investment NSW (Australia)
Denis M'Gee – Magi Solutions (Australia)

3 LCPUFAs that may reduce pressure on diminishing marine stocks as well as offering health benefits to humans.

## OP112
## INFLUENCE OF LUPINS AND CANOLA SUPPLEMENT ON SHORT LOIN FATTY ACID PROFILES WITHIN GENETICALLY DIVERGENT FIRST CROSS MERINO LAMBS

**Bignell, CW**[1,2], Nichols, PD[2], Malau-Aduli, AEO

[1]*Animal Science and Genetics, University of Tasmania, Hobart, Australia*
[2]*Food Futures Flagship, CSIRO Marine & Atmospheric Research*

Australian consumers are becoming increasingly aware of the health benefits of long-chain omega-3 polyunsaturated fatty acids [LC-PUFA] - eicosapentaenoic acid (EPA), 20:5(n-3) and docosahexaenoic acid (DHA), 22:6(n-3). The most common dietary source of long-chain omega-3 is through consumption of seafood and fish oil supplements. Common Australian commercial crops of canola and lupin both offer good sources of LC-PUFA precursers, including □-linolenic acid [ALA, 18:3(n-3)] and their potential as animal feeds to manipulate LC-PUFA concentrations within animal meat is of great interest to the livestock and human health sectors.
This study investigated the LC-PUFA profiles of 38 first cross Merino weaner lambs sired by five genetically divergent rams supplemented with canola meal or cracked lupins at 1% or 2% of body weight feeding levels for 60 days. Results demonstrated that all animals had 'source' content of omega-3 (EPA+DHA) in muscle samples taken from the short loin (loin chop) equal to or greater than 30mg per 100g serve. 18 animals were in excess of 'good source' content of 60mg per 100g serve with a whole flock mean of 67mg/100g EPA+DHA. When docosapentaenoic acid (DPA) is added to EPA+DHA, only two animals do not reach the 'good source' content of long-chain omega-3. Supplement type significantly ($P<0.05$) affected the level of ALA, with canola meal-supplemented sheep producing 91mg/100g compared to 66mg/100g in lupin-fed sheep. Total saturated fatty acid levels also showed a significant ($P<0.05$) interaction with sex and supplement indicating that males fed lupins had the lowest levels of SFA 3860mg/100g compared to males fed canola which had 5180mg/100g SFA.Overall the mean long-chain omega-3 content (mg) per 100g for each breed was: East Friesian 75 mg/100g, Dorset 73 mg/100g, Coopworth 68 mg/100g, Texel 59 mg/100g and White Suffolk 58 mg/100g.
In conclusion feed supplementation markedly enhanced long-chain omega-3 content of Australian lamb. Level of supplementation, breed and type of supplement had no significant relationship with short loin content of long-chain omega-3 FA. However, when supplementing wethers and ewes with canola meal or lupins, attention should be paid to the significant interactions that exist between sexes and supplement type.

## OP113
## INFLUENCE OF LUPINS AND CANOLA SUPPLEMENTS ON PLASMA AMINO ACIDS, WOOL FIBRE DIAMETER AND LIVEWEIGHT IN GENETICALLY DIVERGENT FIRST CROSS MERINO LAMBS

**Malau-Aduli, AEO**[1], Sykes, JM[1], Bignell, CW[1]

[1]*University of Tasmania, Hobart, Australia*

This study hypothesised that there is a positive correlation between plasma amino acids and wool quality parameters of 40 first cross Merino weaner lambs sired by five genetically divergent rams supplemented with canola meal and cracked lupins at 1% or 2% of body weight feeding level for 60 days. Results demonstrated that supplement type significantly ($P<0.001$) influenced liveweight as canola-fed lambs were heavier (40kg) than their lupin-fed counterparts (37kg), but wool yield, daily wool growth, fibre diameter, and body condition score were unaffected by either supplement or level of supplementation. Supplement type significantly ($P<0.05$) influenced the levels of plasma histidine, tryptophan, glutamic acid, threonine, arginine and lysine. There were moderate but highly significant positive correlations ($P<0.01$) between plasma histidine with liveweight (0.43), and fibre diameter (0.35), while lysine was strongly correlated with wool growth (0.37). Sire breed differences were non-significant ($P>0.05$), but the interaction between sire breed and supplement type had a significant effect on body condition score of the lambs ($P<0.05$). Significant interactions between type and level of supplementation ($P<0.05$) led to a decrease in wool fibre diameter. Lamb gender was a significant source of variation for only plasma arginine ($P<0.05$). In conclusion, level of supplementation had no significant effect on wool and growth parameters, thus enabling farmers to decrease the cost of feeding by supplementing at only 1% instead of 2% of body weight. For fat lamb production, supplementing with canola is advisable for higher bodyweight gain, whereas for wool production, either canola or lupins (whichever is cheaper) can be used to minimise feed costs. Crossbred sheep producers supplementing lambs with canola will increase plasma histidine with subsequent increase in liveweight and body condition, but at the expense of finer wool because of its positive correlation with fibre diameter. However, wool growth is expected with an increase in the level of plasma lysine.

## OP114
## MILK COMPOSITION OF GRAZING DAIRY COWS SUPPLEMENTED WITH LICURY OIL

Lima L [1], **Oliveira R** [1], Garcez Neto A [2], Ribeiro C [1], Ribeiro R [1], Bagaldo A [3], Santana Filho N [1], Ribeiro C [1], Borja M [1]

[1]*Universidade Federal Da Bahia*
[2]*Universidade Federal Do Vale Do São Francisco*
[3]*Universidade Federal do Recôncavo Da Bahia*

Licury oil is extracted from one of the main native palm tree located at the northeast region of Brazil, the *Syagrus coronata* (Martius) Beccari. The oil has been used by cosmetic and soap industries; however, there is limited information regarding its use in animal nutrition. The milk composition of grazing dairy cows supplemented with 3 concentrations (0; 1.5; 3; and 4.5%) of licury oil was studied. The oil was added to the concentrate (on a dry matter basis) and fed 3 kg twice daily (at milking). Sixteen dairy cows, Holstein Friesian (*Bos taurus*) x Gir (*Bos indicus*), were used in a four 4x4 Latin Square design experiment, with 17 days for adaptation and 4 days for the collection period. The data were evaluated by a linear regression analyses. Orts were collected daily and weighed at each period, during four days, in order to determine concentrate intake. Milk composition was analyzed for protein, fat, and total solids. Milk protein decreased linearly ($Y=3852 - 0.0753x$ $R^2=0.95$) with oil addition. Milk fat and total solids showed a linear increased, $Y = 3{,}813 + 0032x$ ($R^2 = 0.98$), $Y = 11{,}708 + 0092x$ ($R2 = 0.91$), respectively, with the addition of licury oil to the concentrate. Licury oil addition to grazing dairy cows may be profitable for producers when milk price favors fat and total solids rather than milk protein.