TG×level (P<0.03) showed that SFAR and TGA decreased milk production at the higher infusion amount. Milk fat yield was decreased by UFAA (P<0.01). Unsaturated FA decreased milk fat yield to a greater extent than did saturated FA (P<0.03). All FA treatments decreased short and medium chain FA in milk, with greatest decreases for UFAA. Both UFAA and TGA increased C18:2 in milk. Milk CLA 9,11 was increased by TGA and TGR (P<0.001). Plasma NEFA were higher for UFAA than for TGA (P<0.03). Unsaturated FFA infused abomasally potently decreased DMI in a dose dependent manner. Unsaturated TG and saturated FA depressed DMI to a lesser extent; TG infused abomasally decreased DMI more than saturated FA infused ruminally or abomasally.

Key Words: dry matter intake, fattty acids, triglycerides

570 Fish oil inhibits the biohydrogenation of fatty acids in the rumen causing an increase in milk trans-octadecenoic and conjugated linoleic acid content. K. J. Shingfield*[1], S. Ahvenjärvi[2], V. Toivonen[2], A. Ärölä[2], P. Huhtanen[2], and J. M. Griinari[3], [1]*The University of Reading, School of Food Biosciences,* [2]*MTT Agrifood Research Finland, Animal Production Research,* [3]*The University of Helsinki, Department of Animal Genetics.*

Evidence from animal model and human intervention studies suggest that consumption of milk and dairy products enriched with conjugated linoleic acid (CLA) has the potential to confer significant benefits to human health. Milk fat CLA content can be enhanced through feeding vegetable oil supplements but greater increases have been attained using fish oil (FO). The current study was conducted to identify the mechanisms underlying FO stimulated increases in milk CLA content. Five lactating cows fitted with rumen cannula were used in a continuous-design with two 14 d experimental periods. Cows were offered 18 kg DM/d of a basal (B) diet formulated from grass silage and a cereal based-concentrate (60:40; forage:concentrate ratio, on a DM basis) followed by the same diet supplemented with 250 g FO/d. The flow of fatty acids leaving the rumen was assessed using the omasal sampling technique and the triple indigestible marker method. FO decreased (P=0.06) DM intake (17.7 and 15.7 kg/d for B and FO, respectively) and milk yield (P<0.01; 18.6 and 14.1 kg/d), but had no effect (P>0.05) on milk fat content (46.0 and 42.8 g/kg). Milk fat trans-11 C18:1 (vaccenic acid), total trans-C18:1, cis-9 trans-11 CLA and total CLA content increased in response to FO from 1.80, 4.51, 0.39 and 0.56 to 9.39, 14.39, 1.66 and 1.85 g/100g total fatty acids, respectively. Furthermore, FO caused a shift (P<0.05) in rumen fermentation towards propionate and butyrate, at the expense of acetate, decreased (P<0.001) the amount of C18:0 entering the omasal canal (283 and 47 g/d for B and FO, respectively), increased (P=0.001) total trans-C18:1 fatty acid flow (38 and 182 g/d), but had no effect (P>0.05) on ruminal CLA synthesis (4.36 and 3.50 g/d). Flows of trans-C18:1 acids with double bonds in positions from 4 to 16 entering the omasal canal were all enhanced, but the effects of FO were primarily associated with an increase in the flow of vaccenic acid leaving the rumen (17.1 and 121.1 g/d for B and FO, respectively). FO supplements enhance milk fat cis-9, trans-11 CLA content due to increased trans-vaccenic acid production in the rumen.

Key Words: Fish Oil, Conjugated Linoleic Acid, Trans Fatty Acids

571 Biohydrogenation shift and milk fat depression in lactating dairy cows fed increasing levels of fish oil. A. Ärölä[1], K.J. Shingfield[2], A. Vanhatalo[1], V. Toivonen[1], P. Huhtanen[1], and J.M. Griinari*[3], [1]*MTT, Agrifood Research Finland,* [2]*University of Reading, UK,* [3]*University of Helsinki, Finland.*

Previous studies have demonstrated that milk fat conjugated linoleic acid (CLA) content can be increased with fish oil supplements (FO). Feeding diets to enrich milk CLA concentrations often result in milk fat depression (MFD) and a shift in the ratio of trans-10 to trans-11 C18:1 concentration in milk fat, both of which limit mammary CLA secretion. A 4x4 Latin Square study with four cows was conducted to examine the effects of increasing levels of FO (0, 75, 150, and 300 g/d) on milk fat synthesis and fatty acid (FA) composition, and the threshold for the trans C18:1 isomer shift and MFD. Basal diet consisted of grass silage and a cereal based-concentrate (forage:concentrate ratio 58:42 on a DM basis). Increases in FO dose resulted in linear decreases (P<0.01) in DM intake (19.7, 19.6, 18.8 and 16.4 kg/d, for 0, 75, 150 and 300 g FO/d, respectively), milk fat concentration (39.5, 40.5, 33.1 and 28.8 g/kg) and milk fat yield (960, 987, 848 and 593 g/d). Concentration of total trans-C18:1 fatty acids in milk fat was increased (P<0.001) through dietary FO (4.1, 6.3, 11.4 and 14.3 g/100 g total FA). Both the concentration of trans-10 and trans-11 C18:1 increased (P<0.001) linearly in response to FO (0.29, 0.46, 1.11 and 4.15 and 1.46, 2.52, 5.51 and 6.11 g/100g total FA, respectively). The ratio of trans-10 to trans-11 increased at the highest level of FO (0.20, 0.19, 0.21 and 0.78; quadratic effect P=0.001). Consistent with this, concentration of CLA in milk fat increased linearly only up to the 150 g/d dose level (0.77, 1.26, 2.63 and 2.61; cubic effect P<0.05). Cis-9, trans-11 isomer accounted for proportionately 0.79, 0.84, 0.90 and 0.90 of total CLA. Milk FA responses suggest that the highest level of FO resulted in a shift in rumen biohydrogenation of long-chain FA towards the trans-10 C18:1 pathway. Therefore, in this study 150 g/d of FO was the optimal dose for CLA enrichment of milk.

Key Words: CLA, Fish Oil, Milk Fat

572 Effect of milk urea nitrogen level on probability of conception of dairy cows. K. Guo*, R. Kohn, E. Russek-Cohen, and M. Varner, *University of Maryland, College Park.*

The objective of this study was to evaluate the association between milk urea nitrogen (MUN) and the probability of conception of dairy cows. The data were retrieved from Lancaster DHIA. Cows that were first bred between June 1, 2000 and May 31, 2001 were included in the study (total of 182 dairy herds and 4200 dairy cows). Over all, the mean days from calving to first breeding was 91 days, the mean interval between first and second service was 55 days. Nominal Logistic Regression was used to determine the effects of different MUN levels, test-day milk production, and breeding season on the probability of conception for several services. MUN and milk production data were used from 60 to 90 days post partum for effect on probability of pregnancy at first service, and data from 120 to 150 days post partum were used for probability of conception at second service. Milk production level, seasonal effects, and season by MUN interaction affected (P<0.05) the probability of conception at first service. MUN recorded 90 to 120 days post partum did not affect probability of conception at first service when used as the MUN input. In the regression model for the second and third service, only milk production and seasonal effects remained significant (P<0.05). Probability of conception averaged 27.2, 30.4 and 31.8% at first, second and third service respectively. For all the seasons except spring, cows that had higher MUN were less likely to conceive at the first service. However, in spring, cows that had higher MUN were more likely to conceive at first service.

	HH	HL	LH	LL		HH	HL	LH	LL
Winter	0.28	0.30	0.31	0.33	Summer	0.29	0.32	0.32	0.35
Spring	0.45	0.41	0.48	0.45	Fall	0.15	0.20	0.17	0.23

HH: High Milk Production (45kg/d) and High MUN (16mg/dl), HL: High milk production (45kg/d) and Low MUN (16mg/dl), LH: Low milk production (31kg/d) and High MUN (16mg/dl), LL: Low milk production (31kg/d) and Low MUN (16mg/dl)

Key Words: milk urea nitrogen, probability of conception, reproduction

Contemporary and Emerging Issues
Critical Perspective of Animal Agriculture

573 Livestock, ethics and quality of life. J Hodges*, *European Association for Animal Production.*

Livestock played a key role in development of human societies. This role goes beyond lifting the physical conditions of human life; livestock have also shaped values with the concept of Community of Life. Consequently in pre-modern societies the normal and acceptable standards for caring for livestock were extended to many areas of life and linked with sustainability. In agricultural societies, the derivation of values and ethical behavior emphasizes the common interests of various sectors of society and decision-making processes generally enhance the overall quality of life. In the modern era changes in Western agriculture and in the food chain have been prime factors in reshaping society from a rural to an

urban base. The plentiful supply of food and animal products brought about by the rise of science, the economic success of market economy capitalism and adoption of democracy have also dramatically affected values and ethical standards applied to the food chain. Today Western society sees livestock as a disposable resource, science has joined forces with business, decision making is based solely on economic criteria and the farmer/livestock producer has little influence in shaping the food chain. Thus a new plausibility structure has been accepted by Western society leading to a redefinition of what is normal and acceptable behavior with livestock and animal products. A radical shift in both power and vulnerability in the food chain is occurring which affects livestock, small farmers, the environment, life science companies, rural society, consumers, rich and poor, perceptions of risk, health and safety, etc. Newer and fewer centers of decision making now control the quantity and quality of animal products. The role and nature of agriculture is being redefined, resulting in an unplanned consequence-a lost sense of the Community of Life. Consequently society has a deepening concern about values and ethics in animal science and livestock production. Into this matrix biotechnology has recently been inserted as the major research interest of life scientists and is impacting the food chain in ways not yet fully understood. The paper examines these emerging issues in the context of how contemporary Western society forms its values, views social justice and defines ethical expectations.

Key Words: ethics, issues, sustainable agriculture

574 Value-added Agriculture:Inclusion of Race and Gender in the Professional Formula. M.M. Beck*[1] and J.C. Swanson[2], [1]*Univ of Nebraska, Lincoln, Nebraska,* [2]*Kansas State Univ, Manhattan, Kansas.*

The Morrill Act establishing the land grant university system required that admission to the state universities be available to both women and racial minorities. Today women are close to 50% of the undergraduate population in a number of animal science departments but racial minorities lag far behind, in part because the schools created under the 1890 legislation provided a diversion away from the state universities. In the faculties of the animal science departments, both women and minorities are seriously underrepresented; causative factors underlying this phenomenon are similar. Althought historical adherence to role stereotypes and divisions of labor explain some of the underrepresentation, these assumptions do not hold across all economic classes. Other factors contributing to the scarcity of women and faculty of color in animal science include assumptions and mechanisms of scientific research itself; the very neutrality and disinterestedness of researchers, inherent in the scientific method, prevent recognition that values and personal biases affect decisions of hiring selections and mentoring effectiveness. We will explore the cultural factors that underlie these values and biases that are common not only to agriculture but also to science more broadly.

Key Words: Race and agriculture, Gender and agriculture, Role stereotytpes

575 Rethinking relationships in wretched contexts: the power of privilege. C. Cuomo*, *University of Cincinnati, Cincinnati, Ohio, USA.*

Even a minimal ethical commitment to the interests of animals provides what appears to be a devastating critique of common human/nonhuman relations, including many forms of domestication. If we accept ethical critiques of basic social institutions, but those institutions and practices apparently cannot be simply "abolished," is our participation in them inevitably collusion with oppression?
In agreement with some of the best work in science, feminist and postcolonial ethics begin with the recognition that the boundaries between individuals, and between species, are not as ontologically absolute or morally defensible as anthropocentric and liberal traditions take them to be. Instead, relationships are ontologically and ethically fundamental. For example, right relations provide moral models and make evident the role of empathy, connection, and care in ethical life.
How can these models provide insight regarding participation in institutions that seem to cause so much suffering? Is it possible to be true to our good relationships with nonhuman animals in the context of animal science?
In this paper I will explore what it means to take right relationships to be the starting place for agriculture and animal science. I will emphasize the positive tools at our disposal, and how even institutional practices can be informed by the wisdom generated in cross species relationships guided by empathy and other forms of connection

Key Words: ethics, feminism, empathy

Goat Species

Potent Solutions for Impotent Dewormers: Controlling Resistant Internal Parasites

576 The development of dewormer resistance in small ruminants and consequences. W.E. Pomroy*[1], [1]*Institute of Veterinary, Animal and Biomedical Science, Massey University, Palm/North, NZ.*

Anthelmintic resistance is an increasing problem around the world and has already reached serious levels in areas of South America, South Africa and Australia. The problem is also rapidly emerging in the US, especially in the southern states and greater awareness of the issue is required to attempt to slow its development before the problem becomes unmanageable. The majority of the available evidence suggests that once anthelmintic resistance to any anthelmintic has developed in a population the gene frequency is stable and does not decline. There are only 3 broad spectrum action families of anthelmintics available and no new ones likely to be available in the near future so every effort needs to be made to preserve their efficacy for as long as possible. There are some narrow spectrum anthelmintics available for *Haemonchus contortus* but most of these are not available in the USA. This review will summarise the arguments for and against the commonly promoted recommendations to delay the onset of anthelmintic resistance: to decrease the number of times animals are dewormed, to quarantine drench all incoming animals, to rotate between action families on an annual basis and to avoid underdosing. The advantages and disadvantages of long acting anthelmintics such as moxidectin will be discussed as will the additional challenges of worm control in goats by comparison with sheep. It is well recognised that goats metabolise anthelmintics more rapidly than sheep and this has implications for the choice of dose rate.

Key Words: Goats, Internal parasites, Dewormer resistance

577 Emerging issues in control of nematode parasites of goats: anthelmintic resistance and biological control using nematophagous fungi. T.H. Terrill*[1], R.M. Kaplan[2], M. Larsen[3], and J.E. Miller[4], [1]*Fort Valley State University, Fort Valley, GA,* [2]*The University of Georgia, Athens, GA,* [3]*The Royal Veterinary and Agricultural University, Copenhagen, Denmark,* [4]*Louisiana State University, Baton Rouge, LA.*

Gastrointestinal nematode (GIN) parasitism is the most important disease of goats throughout the world. Infection with GIN parasites causes significant losses in growth and productivity and may lead to animal deaths if not controlled. The conventional method of controlling GINs in goats is frequent deworming with anthelmintics, which increases selection for drug resistance in the parasites. As a result, prevalence of multiple-drug resistant GINs in goats is reaching alarming proportions in many parts of the world. Recent reports from the southern United States show that GIN resistance to all three available classes of anthelmintics is an emerging problem, suggesting that alternatives/additions to anthelmintic control of goat parasites are needed. A novel approach to controlling goat GINs is using the nematode-trapping fungus *Duddingtonia flagrans* as a biological control agent. Spores of this fungus are fed to the animal, pass onto pasture in feces, and then trap and kill developing parasite larvae in the fecal pellet. This technique has been shown to reduce development of GIN larvae in feces by over 90% in goats and sheep in confinement. This reducing effect in feces has been confirmed in controlled field trials with sheep and preliminary grazing experiments with goats. Successful control of goat GINs in the future may require use of both novel (biological control, GIN vaccines, etc.), and conventional (strategic use of effective anthelmintics plus grazing management) strategies in an integrated program.

Key Words: Goats, Gastrointestinal nematodes, Anthelmintic resistance, Biological control