vitro, cinnamon oil reduced spore germination and germ tube length in C. coccodes, B. cinerea, C. herbarum and R. stolonifer with the effects were dependent on oil concentration. However, cinnamon oil (up to 100ppm) accelerated spore germination for A. niger. Wound-inoculated pepper fruit accelerated B. cinerea and C. coccodes development following 3days vapour exposure to cinnamon and this effect was not persisted for longer exposure but no differences observed for tomato fruit. Pre-exposing tomato fruit to 500ppm cinnamon vapours and then inoculated with fungi, reduced B. cinerea and C. coccodes lesion development [Nikos G. Tzortzakis (Department of Hydroponics and Aromatic plants, Institute of Olive Tree and Subtropical Plants, National Agricultural Research Foundation (N.AG.RE.F.), Agrokipion, 73100 Chania, Greece), Innov Food Sci Emerg Technol, 2009, 10(1), 97-102].

NPARR 1(1), 2010-22, Impact of plant essential oils on microbiological, organoleptic and quality markers of minimally processed vegetables

The efficacy of plant essential oils (EOs) for control of the natural spoilage microflora on ready-to-eat (RTE) lettuce and carrots whilst also considering their impact on organoleptic properties was evaluated. Initial decontamination effects achieved using EOs was comparable to that observed with chlorine and solution containing oregano recorded a significantly lower initial TVC level than the water treatment on carrots (p<0.05). No significant differences were found between the EO treatments and chlorine considering gas composition, colour, texture and water activity of samples. The sensory panel found EO treatments acceptable for carrots throughout storage, while lettuce washed with the EO solutions were rejected for overall appreciation by Day 7. Correlating microbial and sensory changes with volatile emissions identified 12 volatile quality markers. Oregano might be a suitable decontamination alternative to chlorine for RTE carrots, while the identification of volatile quality markers is a useful complement to sensory and microbiological assessments in the monitoring of organoleptic property changes and shelf-life of fresh vegetables [Jorge Gutierrez, Paula Bourkea, Julien Lonchamp and Catherine Barry-Ryan (*School of Food Science and Environmental Health, Dublin Institute of Technology, Cathal Brugha Street, Dublin 1, Ireland), Innov Food Sci Emerg Technol, 2009, 10(2), 195-202].

NPARR 1(1), 2010-23, Production performance and milk composition of dairy cows fed extruded canola seeds treated with or without lignosulfonate

Eight multiparous Holstein cows averaging 538kg of body weight and 62 days in milk were used in a double 4x4 Latin square design with four 21-d experimental periods to determine the effects of feeding extruded versus non-extruded canola seed treated with, or without, 50g/kg lignosulfonate on apparent whole tract digestibility, feed intake, milk production, milk composition and milk fatty acid profile. Intake of dry matter (DM) and its components was similar among treatments. Extrusion had no effect on digestibility but decreased milk fat concentration. Lignosulfonate treatment of canola seeds decreased digestibility of DM and crude protein (CP). Milk production, milk concentrations of CP, lactose and total solids, and milk yields of CP and fat were similar among treatments. In general, there was no interaction between extrusion and lignosulfonate for milk fatty acid profile. Feeding extruded canola seeds increased milk fat concentration of trans 11 18:1 to a greater extent without, than with, lignosulfonate treatment (150% versus 113%). Thus, it is clear that extrusion had more effects than lignosulfonate treatment on milk fatty acid profile, but changes were small and likely of little biological importance for human health [CA Neves, WBR dos Santos, GTD Santos, DC da Silva, CC Jobim, FS Santos, JV Visentainer and HV Petit (Deptamento de Zootecnia, Universidade Estadual de Maringá, Maringá, PR 87020-900, Brazil), Anim Feed Sci Technol, 2009, 154(1-2), 83-92].

NPARR 1(1), 2010-24, Stability of fatty acids in grass and maize silages after exposure to air during the feed out period

Lipids in forages are extensively hydrolysed in the silo with a concomitant increase in the level of free fatty
acids (FFA). After opening of the silo, exposure of the FFA to air and light with, a concomitant increase in pH and microbial growth, could induce oxidization. The present study investigated the stability of FA in grass and maize silages exposed to air for 0, 12 and 24h. Eight maize silages were selected with varying dry matter (DM) contents, being very wet, wet, normal and dry. In addition, eight grass silages were chosen on the basis of ammonia (NH₃) concentration and pH level. Grass and maize silages were sampled 8-10 weeks after ensiling and anaerobically transported to the lab in cooled plastic bags. After mixing, each sample was divided into three subsamples and exposed to air for 0, 12 or 24h. Concentrations of individual FA were quantified by gas chromatography. Among the investigated silages, concentrations of total FA varied greatly and ranged from 16.4 to 23.9 and 9.5 to 21.6 g/kg DM in grass and maize silages, respectively. Exposure to air up to 24h lowered (P<0.01) the contents of linolenic acid (C18:3), linoleic acid (C18:2), oleic acid (C18:1) and total FA in maize silages. In grass silages, 24h exposure to air decreased (P<0.05) concentrations of C18:3, C18:2 and total FA (P<0.01). In both grass and maize silages a decline in concentrations of major unsaturated FA (UFA) was associated with a concomitant increase (P<0.01) in the proportion (g/g total FA) of palmitic acid (C16:0). The relative decrease in total FA after 24h exposure to air was higher in maize silages with a high moisture content, and progressively decreased with increasing DM content. In contrast, pH and NH₃ levels of grass silages had no effect on the stability of FA during feed out. The present study demonstrates that extended exposure of silages to air during feeding increased the proportion (g/g total FA) of C16:0 and lowered the concentration of polyunsaturated FA [NA Khan¹, JW Cone and WH Hendriks (¹Animal Nutrition Group, Department of Animal Sciences, Wageningen University, PO Box 338, 6700 AH Wageningen, The Netherlands), Anim Feed Sci Technol, 2009, 154(3-4), 183-192]

Groundnut straw based complete feed blocks with (YS) or without (YU) yeast (Saccharomyces cerevisiae) were fed to sheep to study the effect on nutrient utilization, growth performance and rumen fermentation pattern by conducting a growth trial of 120 days followed by metabolism trial of 7 days on 12 male Magra lambs divided in two groups of 6 in each. The dry matter intake was 72.13 and 74.33 g/kg W₀.75, and 3.52 and 3.56 kg/100 kg BW, respectively in YU and YS groups. Apparent digestibility of dry matter, organic matter, gross nutrients and fibre fractions were comparable between two groups. Average daily gain was significantly higher in YS group (88.57g) compared to YU group (80.26g), whereas, feed conversion ratio was similar. The DCP and TDN contents were 10.53 and 51.82 per cent in YU group and 11.32 and 56.38 per cent in YS group, respectively. Animals of both groups were in positive nitrogen, calcium and phosphorus balance. Yeast supplementation significantly improved rumen fermentation by stabilizing rumen pH, decreased concentrations of lactic acid, ammonia nitrogen, NPN and increased TVFA, total protozoal counts, total nitrogen and TCA perceptible nitrogen. It was concluded that groundnut straw based complete feed blocks along with yeast supplementation could be beneficial to improve performance of sheep due to a marked improvement in rumen fermentation pattern [DD Garg, T Sharma and R K Dhuria (Department of Animal Nutrition, Navsari Agriculture University, Navsari-396 450, India), Anim Nutr Feed Technol, 2009, 9(2), 137-144].
libitum quantity of Napier Bajra green fodder as basal feed. The crude protein content of NB green fodder, subabul, sesbania, acacia, jack, yellow gold mohur and cashew were, respectively, 10.38, 21.31, 34.44, 15.94, 12.82, 12.69 and 9.69 per cent. Total DM intake (g/day) of goats was 380, 444, 459, 477, 424 and 352, respectively, for the six experimental diets. Digestibility of DM and OM were enhanced (P<0.05) in goats fed on all the tree foliage-supplemented diets, except for that supplemented with cashew leaves. Greatest depression was observed in the digestibility of NDF (38.32%) and ADF (23.86%) when goats were fed on cashew (P<0.05), followed by yellow gold mohur and jack as supplementary feeds. Based on nitrogen and calcium retention and nutrient intake data, it was concluded that sesbania, subabul, jack and acacia foliage were better than yellow gold mohur and cashew in their supplementary role [DV Reddy*, CM Tiwari, N Elanchezhian and Uma D Maheswari (Department of Animal Nutrition, Rajiv Gandhi College of Veterinary and Animal Sciences, Pondicherry-605 009, India), Anim Nutr Feed Technol, 2009, 9(2), 155-163].

FIBRES
(incl. Textile and other utility fibres)

NPARR 1(1), 2010-27, Chemical composition of lipophilic extractives from jute (Corchorus capsularis Linn.) fibers used for manufacturing of high-quality paper pulps

The chemical composition of the lipophilic extractives from jute (C. capsularis Linn.) fibers, which are used for high-quality paper pulp manufacturing, was thoroughly studied. The extractives content was low (0.4%), and its composition was studied by gas chromatography-mass spectrometry. For a better characterization of the different homologous series and compounds present in minor amounts, the extract was also fractionated by solid-phase extraction. The most predominant lipophilic compounds present in jute fibers were high molecular weight ester waxes (24% of total extract), followed by free fatty acids (17%), free fatty alcohols (17%) and ±-hydroxyfatty acids (14%). Additionally, significant amounts of alkanes (6%), É-hydroxyfatty acids (6%), sterols (6%), steroid and triterpenoid ketones (3%) and steryl glycosides (1%) were also identified, together with minor amounts of mono- and diglycerides [José C. del Río*, Gisela Marques, Isabel M. Rodríguez and Ana Gutiérrez (*Instituto de Recursos Naturales y Agrobiología de Sevilla, CSIC, P.O. Box 1052, E-41080 Seville, Spain), Industr Crops Prod, 2009, 30(2), 241-249].

NPARR 1(1), 2010-28, Potential of kenaf fibres as reinforcement for tribological applications

This paper presents an attempt to use kenaf fibres as reinforcement for tribo-composite based on epoxy for bearing applications. Kenaf fibres reinforced epoxy (KFORE) composite was fabricated using a closed mould technique associated with vacuum system. Sliding wear and frictional behaviour of the composite were studied against polished stainless steel counterface using Block-On-Disc (BOD) machine at different applied loads (30-100N), sliding distances (0-5km) and sliding velocities (1.1-3.9m/s). The effect of the fibre orientations, with respect to the sliding direction, was considered; these orientations are parallel (P-O), anti-parallel (AP-O) and normal (N-O). The morphology of the worn surfaces of the composite was studied using a scanning electron microscope (SEM). The result revealed that the presence of kenaf fibres in the composite enhanced the wear and frictional performance of the epoxy. Applied load and sliding velocity have less effect on the specific wear rate of the composite in all the three orientations. The composite exhibited better wear performance in N-O compared to P-O and AP-O [CW Chin and BF Yousif* (*Faculty of Engineering, University of Nottingham, Jalan Broga 43500 Semenyih, Selangor Darul Ehsan, Malaysia), Wear, 2009, 267(9-10), 1550-1557].

NPARR 1(1), 2010-29, Effect of bio-friendly conditioning agents on jute fibre spinning

From early times, jute fibre has been generally conditioned for easy spinning by adding oil and water in the form of an emulsion. The commonly used oil consists of C_{12}-C_{31} fractions of mineral oil that sometimes impart different intensities of oily (kerosene) or fishy smell to the end product. In the present work, efforts have been