



LINSEED TO CONTROL LIPID MELT IN DUCK FOIE GRAS?

Foie gras lipid melt denotes lipid loss in the form of exudate occurring during heat treatment to preserve the product (pasteurisation or sterilisation). Earlier studies showed that lipid melt tended to decrease with the supplementation of 2% extruded linseed (ELS - a source of omega-3) to the duck force feed. This decrease is attributed to the greater elasticity of the liver cell membranes resulting from omega-3 fatty acid enrichment.

Research aimed at supporting this assumption has continued by investigating the effects of the extruded linseed supplementation duration (13 or 34 days) and rate (2 or 3%) on liver lipid melt and the fatty acid composition of the phospholipids (the main components of the cell membranes). Lipid melt tends to de-

crease (-24%) at supplementation rates of 2 and 3% ELS in the force feed (for 13 days). However, a significant loss of liver weight (-21%) was recorded at the highest level of ELS supplementation. This may be due to increased stimulation of the lipoproteins, which are responsible for lipid transfer to the peripheral tissues. Disturbances to the liver cell membrane structure are probably responsible for the lipid melt increase (+62%) at the longest supplementation duration (21 days preceding force feeding plus 13 days of force feeding). Major changes were in fact observed in the membrane phospholipid composition, with a decrease in saturated fatty acids (stearic acid) and polyunsaturated fatty acids (linoleic acid and its derivatives) and an increase in monounsaturated fatty acids (oleic acid). In the end it was

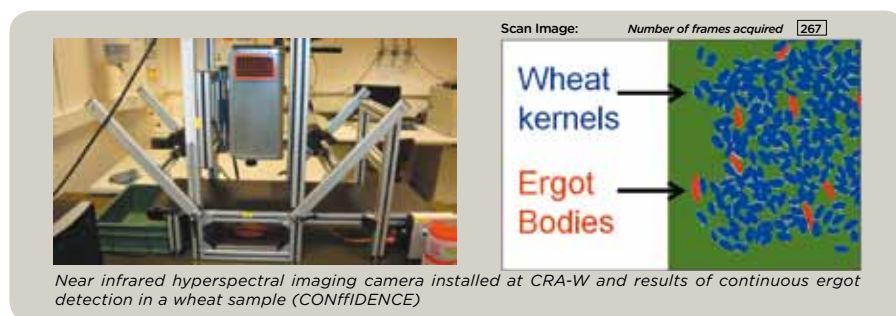
not possible to validate the initial assumption because of a lack of correlation between lipid melt and the omega-3 fatty acid content of the phospholipids.

The results indicate that the addition of not more than 2% ELS during force feeding is the only one of the practices considered that reduces lipid melt with no significant loss of liver weight. The mechanisms of ELS action on lipid melt are still unknown, however.

This research was carried out with the financial support of SPW, DG03. We should like to thank Mr Petit of Upignac for his logistical assistance and Mr Malotau for the feeding of the ducks.

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NEAR INFRARED HYPERSPECTRAL IMAGING, A FUTURE DECISION SUPPORT TOOL?



In view of the growing number of quality parameters that have to be controlled increasingly frequently in the food chain it is becoming more and more essential to develop analytical methods that are rapid, inexpensive, multicomponent and environmentally friendly. Since 2000 CRA-W has developed near infrared hyperspectral imaging expertise for the benefit of the various agricultural and food industry sectors. This technology is the result of the very latest developments and it provides spatial and spectral data on

a sample simultaneously in a single analysis. With this technique the qualitative or quantitative analytical results can be linked to morphological data. Near infrared hyperspectral imaging appears to be a tool of choice for on-line quality monitoring of inputs and finished products in the various agricultural and food sectors.

CRA-W's expertise has been acquired through a number of cooperative links with public-sector institutes and private companies at regional, national

and international levels. The agricultural product studies involve detecting impurities and contaminants like ergot in cereals (CONFIDENCE) and testing imported agricultural produce on arrival at processors (QSaffe). Other work on food products involves monitoring the ageing of foodstuffs (CONSALIM) and detecting MBM in cattle feed (SAFEED-PAP, EURL-AP). Seeds are another aspect of CRA-W's research. A number of experiments have been conducted in the context of a private cooperative link with SEVANDERHAVE. Imaging was assessed as an aid to selecting nematode-resistant beet varieties, by detecting and counting root cysts, or as a beet seed quality control tool.

The research conducted by CRA-W shows that near infrared hyperspectral imaging can meet the needs of agriculture and the food industry and is indeed an important decision support tool.

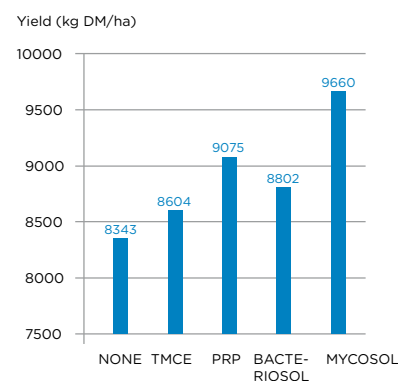
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POTENTIAL OF SOIL MICROBIAL ACTIVITY STIMULANTS IN PASTURE

Pasture accumulates large amounts of organic matter in the top soil horizon. Although this plays a positive part to mitigate CO₂ concentrations increase in the atmosphere, it may be advantageous to stimulate mineralisation so as to make various nutrients available to the cover in situ and to limit the need for fertiliser. In this context the effectiveness of two major product families - one aimed at stimulating soil microflora and microfauna activity in the form of lime (products manufactured by TMCE and PRP), the other directly supplying a cocktail of microorganisms (products such as Mycosol and Bacteriosol) - was assessed by CRA-W in pasture at Libramont, over a three-year period, with the support of the Regional Government of Wallonia. For the purposes of the research the hay meadow received no phosphorus or potassium input excepted for the modality fertilized with 30 tonnes of manure per hectare per year. Nitrogen applications ranged from 0 to 120 kg per hectare per year according to the system in operation.

After three years of monitoring it has to be said that, compared with an untreated control, the test products did not succeed in curbing the fall in soil phosphorus and potassium levels caused by their removal in successive hay harvests. Nevertheless, as the graph illustrates, an increase of the average yield of 1,300 kg DM/ha was observed with application of Mycosol in comparison to the control, with no impact on the quality of the biomass harvested. Among the organic conditioner based products the outstanding one was Mycosol, containing about 12% potassium and 7% nitrogen, whereas PRP, which contains little of these elements, seems useful for liming purposes. These effects were apparent whether or not nitrogen was applied, and less marked after the application of organic fertilizer (manure). But are these results economically viable? Taking into account the cost of the materials, the cost per tonne of additional dry matter harvested is 100, 260, 340 and over 500 euros with Mycosol, PRP, Bacteriosol and TMCE, respectively. So this needs further thought:

depending on the interest from the farmers, these experiments could be repeated with a moderate application of phosphorus-potassium fertilizer to establish whether these effects are confirmed under such conditions.



This project was subsidised by the Regional Government of Wallonia, Department of Agriculture, Natural Resources and the Environment, Development and Extension Section.

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PAIN MANAGEMENT IN PIGLETS UNDERGOING SURGICAL CASTRATION AT LESS THAN 8 DAYS OF AGE



Surgical castration of piglets is an animal welfare issue. It has been scientifically proved that surgical castration is painful for the piglet. Current legislation requires anaesthesia and prolonged analgesia if the piglets are aged 7 days or more. Likewise, a European Declaration on alternatives to surgical castration of piglets made on November 2010 and coming into operation on 1st January 2012, proposes the same procedure for piglets aged under 8 days.

A research was conducted at the CRA-W experimental farm in partnership with the Swine clinic (Faculty of Veterinary Medicine - University of Liège) to compare the effects of two non-steroidal anti-inflammatory drugs, meloxicam and tolfenamic acid, both of which have analgesic properties, on piglet pain and stress during and after castration. To that end a number of lesional, physiological and behavioural

criteria were compared on 66 piglets from 12 litters randomly distributed over four treatments:

- Castration at 5-6 days of age preceded, one hour earlier, by an intramuscular injection of physiological serum;
- Same treatment, but with an injection of meloxicam;
- Same treatment, but with an injection of tolfenamic acid;
- No castration, no preoperative injection, but castration was simulated (sham group).

Three operators performed the different treatments. This was a blind trial, with only the operator giving the injections knowing the treatment for each pig. Measurements and observations were made during and after the treatments: duration of each operation (castration or simulation) proportion of time spent by the piglets trying to escape and/or screaming, maximum intensity of vocalization during the operation (sound level meter), activity (in particular, prostration, scratching the scrotum, tail agitation) and the position of each piglet 1^{1/2} hours, 3 hours, 4^{1/2} hours and 30 hours after the treatment (video recordings and instantaneous scan sampling), the piglets' serum cortisol (stress hormone) concentration half an hour and 24 hours after treatment, and the piglets' average heart rate during the operation.

The results showed that with or without prior analgesia, castration is painful and stressful. The castrated piglets spent significantly more time trying to escape from handling than the uncastrated ones. Their vocalization had a higher intensity and they displayed more scrotal scratching after castration than the sham group. Some parameters (intensity of vocalization, time spent crying, cortisol level and heart rate) did not vary between castrated and uncastrated animals. This no doubt shows that the restraint involved in the experiment created considerable stress. Generally, though, the use of preoperative analgesia appears to reduce the pain and stress of castration minimising the expression of certain behaviours such as desynchronization of suckling. Tolfenamic acid tended to be more effective than Meloxicam, both during castration (attempts to escape, time spent crying, intensity of vocalization) and afterwards (less isolation, less scrotal scratching, less tail agitation).

These results were presented at the Journées de la Recherche Porcine conference in Paris in February 2012.

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CRA-W AND CIPAC: WORKING TOGETHER FOR MORE THAN 50 YEARS

CIPAC, the Collaborative International Pesticides Analytical Council, is an international, non-profit-oriented and non-governmental organization whose object is to

- promote international standardisation of methods for the analysis of pesticides and physico-chemical test methods for formulations
- promote inter-laboratory programmes for the evaluation of test methods (www.cipac.org/index.htm).

The methods are proposed by companies and are tested by laboratories all over the world. After evaluation of the results and adoption, the methods are published in the CIPAC Handbooks.

CRA-W has been closely linked with CIPAC's work since its inception in

1957. Olivier Pigeon of CRA-W was appointed CIPAC correspondent in June 2007 and became a member of CIPAC in June 2011. He thus succeeds his predecessors Michel Galoux, who was a member from 1989 to 2007, and Jean Henriet, who was one of the founder members, was the president of CIPAC for several years and is currently an honorary life member.

Over the last ten years CRA-W has taken part in some fifty studies aimed at standardising analytical methods for active substances and their impurities in technical compounds and pesticide formulations and methods for determining the physico-chemical properties of pesticides. Recently, CRA-W also became involved in coordinating a collaborative study with CIPAC

aimed at measuring the washing resistance of insecticide-treated mosquito nets used to control tropical diseases. These standardised analytical methods are applied to the development of FAO and WHO specifications for the pesticides used in agriculture and public health, to carry out physico-chemical studies for product approvals, and for quality control of pesticides placed on the market.

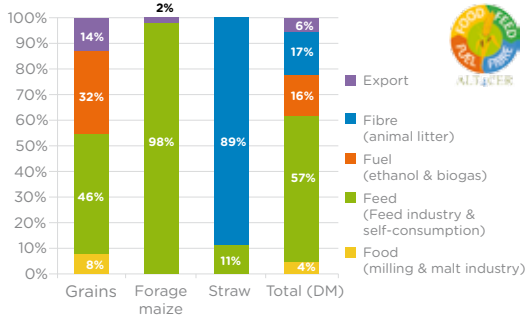


Olivier Pigeon, elected a CIPAC member in June 2011.

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WALLONIA'S CEREALS IN 2030: WHAT ARE THE OPTIONS?

Uses for Wallonia's Cereals in 2010



The main outlet for Wallonia's cereals is animal feed (Feed). For reasons of climate, small lot sizes and insufficient returns on higher quality varieties (Food), their use for direct human consumption (milling, brewing) is continuously declining. Non-food uses, such as biofuels (Fuel) and insulating panels made from straw (Fibre) are rising and could be promising. So, with a view to sustainability, Wallonia's cereal chains must reach a compromise between various possible outlets in order to reconcile their products with world growth, rising energy costs and environmental concerns.

To achieve sustainability, agriculture has to face a number of challenges: integrated management of farmyard manure and mineral fertilizers, maintaining yield, diversifying crops and sources of income, food / non-food crop competition for arable land, etc. More than half the arable land in Wallonia is occupied by cereals, principally winter wheat (36%), silage maize (16%) and winter barley (10%). Spelt, being hardy, is also commonly grown on the poorer, steeper land of the Ardenne.

As a response to these requirements with the involvement of the players in the sectors and areas concerned, the ALT4 CER project aims at defining and assessing the relevance of scenarios for food and non-food uses of Wallonia's cereal resources. In Phase One an inventory of cereal resources and flows was produced in cooperation with cereal industry players and "4F" (Food, Feed, Fuel, Fibre) cereal use scenarios were defined, looking ahead

to 2030. Phase Two of the project comprises the parallel development of Environmental Life Cycle Analyses (ELCA) and Socioeconomic Life Cycle Analyses (SLCA) in order to characterise the economic, environmental and social performance of the different scenarios defined in Phase One. The results of the environmental and socioeconomic LCAs will then be integrated through multi-criteria analysis, again with the support of the players of the cereal sector.

By focusing the approach on an analysis of different scenarios for using Wallonia's cereal resources ALT4 CER aims to come up with answers to the questions facing society: 'What kinds of agriculture do we want in the future? Is it ethically, environmentally and economically sustainable to continue using cereals for purposes other than human food?'

The ALT4 CER project (2011-2014) is financed by CRA-W via the tax relief granted to scientific research (Moerman Act).

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For more information visit <http://www.cra.wallonie.be/index.php?l=fr&page=19&id=279>

DURAGR'ISO FARMERS HONOURED

Province of Namur SUSTAINABLE DEVELOPMENT PRIZE

The Province of Namur, in cooperation with Fondation pour les Générations Futures, is supporting sustainable development through the Sustainable Development Prize (www.province.namur.be/Internet/sections/prix_du_developpement/).

This year, the panel of judges awarded it to the farmers of Namur (and Wallonia) in the DurAgr'ISO association for their collective initiative aimed at reducing the environmental impact of their enterprises by setting up an environmental management system based on the requirements of the ISO14001 international standard (Terr'Avenir Wallonie initiative).

The prize was presented by the Provincial Councillor, Jean-Marc Van Espen, at a ceremony in Namur on 9 March. They have thus qualified to enter for the Grand Prix belge des Générations Futures 2012 - to be continued in the next edition.

Congratulations to the farmers involved in the project!

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DIARY

27 - 30 July 2012
LIBRAMONT AGRICULTURAL FAIR
• Friday 27 July at 1.30 p.m.



The Future of Food. On all four days: lots of activities, presentation of projects, competitions

28 November 2012
PORK AND POULTRY PRODUCTS SEMINAR

Now in its 12th year, and this year's topic is Current Developments. Keep the date free!

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