



Milk and dairy product composition and quality analysis at CRA-W

The CRA-W dairy laboratory has always been very active in the area of milk and milk derivative analysis since it was opened as the “Dairy Station” in 1900. Over the years the laboratory has established a reputation that extends beyond our national frontiers. The aims pursued by the laboratory today have not changed greatly over more than a century: providing the best possible expertise in the field of milk analyses, developing new analytical tools, assessing the latest analytical innovations, setting up proficiency tests and supplying the necessary tools to guarantee consistent measurement at all Belgian milk analysis laboratories.

CRA-W's experience with starter cultures has also been made available to the public for many years through our lactic starters service. We thus provide advice and assistance with the making of fermented milk products and fromage frais, far beyond the borders of Wallonia. CRA-W also has more than twenty-five years' experience in infrared spectroscopy and chemometrics. Over the years, a number of applications have been developed for assessing the quality and composition of milk and milk derivatives.

This accumulated expertise enables CRA-W to offer its services in the area of milk and dairy product composition and quality analyses to a wide clientele (analytical laboratories in Belgium and other countries, dairies, cheese makers, food processing industries, the authorities, breeding associations, research centres, universities, farmers, individuals, etc.)

- Chemical analysis of milk and dairy products: fat*, total nitrogen*, dry matter*, fatty acid profile *, inhibitors*, lactose, urea, caseins, ash, minerals, lipolysis (free fatty acids), triglycerides (purity of butterfat), etc.
 - Microbiological analysis of milk and dairy products: total germ count*, coliforms, yeasts, moulds and lactic bacteria.
 - Supply of calibration standards for infrared spectrometers: fat and proteins
 - Supply of standards: Belgian standard (fat, total nitrogen, cryoscopy, urea), MIR standard for fatty acid profile, cells, germs, inhibitors
 - Selection and distribution of yoghurt, kefir and cream starters
 - Development and supply of infrared spectrometry prediction equations
 - Proficiency testing
- * ISO 17025 accredited analyses

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Two-stage weaning of calves from suckling cows – an innovative approach?

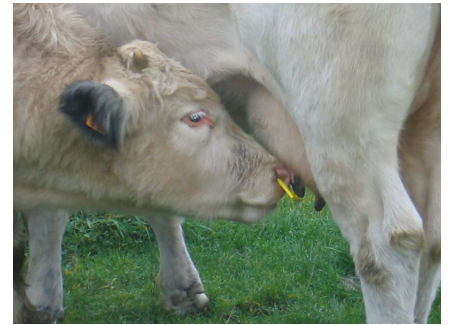
Among suckling cattle, the calf and its mother vocalize repeatedly in the three to four days following weaning. On the calf's part, lowing shows a state of stress and indicates distress due to the sudden cessation of suckling and contact with its mother. The calves have an unusually high cortisol level and their circadian activity rhythm is temporarily upset.

In cooperation with the Regional Government of Wallonia, Department of Agriculture, Development and Extension Section, CRA-W is trying out a two-stage weaning method. The aim is to sever the bond between cow and calf without causing stress to the calf. The method involves attaching an antisucking device (nose-flap) to the calf's nose (stage 1) for four to seven days before the traditional physical separation from the mother (stage 2). The calves learn to stop suckling while remaining in contact with the mother.

An initial trial was conducted with 215 nose-flaps on a dozen farms. This demonstrated the ease of use of the method and provided feedback on animal behaviour. Virtually no lowing occurred prior to separation of the calves from the mothers or in the three to four days that followed. The farmers who tested the method were positive overall.

A second trial took place last autumn. The aim was to test the hypothesis that two-stage weaning reduces stress in calves by means of a comparison with conventional weaning (one batch of 2 x 5 calves, pedometers, *in situ* observations before and after separation). The daily activity of calves weaned in two stages was found to be significantly lower after separation: 2,197 steps per calf compared with 2,945 with conventional weaning. Lowing was also significantly reduced, to 6 instances per calf per hour as against 28 with conventional weaning, a 77% de-

crease. The calves were less distressed and suffered less stress. This provides material for research into the development of animal welfare oriented farming systems, in particular cow – calf separation procedures, as urged by the Standing Committee of the European Convention for the Protection of Animals Kept for Farming Purposes in Strasbourg in November 2006.



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Highlighting and developing the multifunctional nature of farms

What should be the significance and the role of agriculture in our fast-changing world? To answer this question we need to be able firstly to describe the exchanges that take place between farms and the areas in which they operate and, secondly, to integrate the expectations of the various players using these areas with respect to agriculture. Testing and validating tools and methodologies for achieving this twofold aim was the main focus of the GEMINER project (management of the natural environment and rural areas), which was co-financed by the European Union and the Regional Government of Wallonia in the context of the INTERREG III programme – Wallonia-Lorraine-Luxembourg.

The progress made possible by this project, which was coordinated by the Institut de l'Élevage and brought together CONVIS (Luxembourg), the Chambers of Agriculture (Lorraine) and ULg and CRA-W (Wallonia), was presented at a closing seminar held near Thionville on 15 November 2007.

Following an introduction in which Ms A. Guillaumin, of the 'Institut de l'Élevage', emphasized that developing and involving farms in parallel functions to food production was the result of each farmer's specific interests and wishes, in accordance with the opportunities offered by the area in which that farmer operated, two sets of tools were presented.

The first set sought to quantify the multifunctional nature of the farm by, for example, measuring the exchanges between farms and their environment through the use of mineral, humic or energy balances. The feasibility of setting up, on a farm, an environmental management system, recognized by the authorities, based on the principle of continuous improvement as applied in industry to improve environmental performance of the exploitations. Some adaptations were proposed to improve the operationality of such tools in the specific context of agriculture.

The second set of tools concerned methods aimed at supporting the emergence of collective dynamics. These methods are intended to open the way for dialogue and exchange of ideas between groups of players using the same area, sometimes in conflicting ways. Among these methods mention may be made of (1) the development of a participatory prospective exercise at territory level, with innovative possible future scenarios for that area, by looking at the long term in order to limit attempts at prediction, and (2) the development of sensitive approaches, through photography, walking or video, in order to share the issues associated with an area, a meadow or an occupation with the other users of that territory.

In bringing the seminar to a close, Mr Ch. Mulders, of the Regional Government of Wallonia Department of Agriculture, said

that although one still wants more, in the sense that the dynamics supported are often far from complete, the advantage of the majority of the methods presented is that they really do open the way for a dialogue, something which is difficult or non-existent at present, between the different users of an territory in order to explore innovative alternatives for linking up the different issues relating to that area.



One aim of the GEMINER project was to develop tools for the emergence of collective dynamics bringing together the different players within a territory

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Cherry tree varieties: 34 new data sheets published

Breeders in Europe (France, Germany, the Netherlands, Italy, the Czech Republic, Hungary, etc.), North America (Canada, USA) and other parts of the world (Australia, etc.) keep coming up with new varieties of cherry tree. CRA-W assesses these new varieties in terms of crop husbandry and palatability in order to identify the ones suited to our pedoclimatic conditions and meeting Belgian commercial requirements.

The number of criteria to be taken into consideration makes the choice of the best cultivars difficult. Once the vigour and habit of the cultivars are known, the most appropriate cultivation method can be selected and the planting density adapted to the orchard. Flowering and ripening dates in our climatic conditions guide the choice of cultivars according to spring frost risks, on one hand, and to harvest staggering, on the other. Pollen

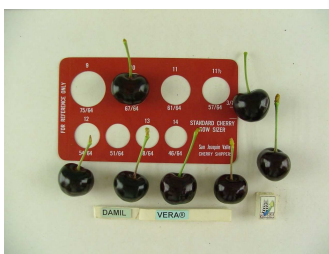
compatibility determines the pollinator combinations. The main productivity criteria are cultivar fertility, earliness and density of fruitset, size, susceptibility to bursting and the quality of the fruit.

This work, undertaken in compliance with the standards and agreements for the protection of plant accessions, involves a minimum of three years' observations and results in the periodical publication of new data sheets for varieties added to the published list ('The cherry in intensive orchards', 113 sheets). These sheets are sent out to the holders of earlier lists.

The varieties are then kept in a conservation orchard as a stock of control trees allowing the identity certification scheme checking (GI) by means of morphobiological comparison and molecular biology markers. The virological

status (VF) of the most promising varieties for the Belgian market is also checked and a thermotherapy and/or meristem culture treatment is carried out in the case of viral infection before the varieties are released to growers via approved wood parks.

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Is there any transgenic oilseed rape in Wallonia?

To answer this question, the Regional Government of Wallonia Department of Agriculture (DGA) issued an invitation to tender. In May 2006 CRA-W, in a joint venture with the Agricultural University's Ecology Laboratory and the Walloon Agrobiopôle, won the research contract for transgenic rape in Wallonia. Some experimental plots of transgenic rape were indeed planted in Wallonia in the nineties, mainly in Hainaut and Namur province. As the DGA's working party on rape coexistence had come to the conclusion that research would have to be undertaken to check for transgenic rape in Wallonia, the DGA accordingly launched the tender process.

The CRA-W's Molecular Biology Laboratory is the kingpin of the project. However, the sampling plan was drawn up in cooperation with the CRA-W Biometry Unit. In view of the procedure followed, it may be concluded that if not one transgenic rape plant is found, there is a 95% chance of the 0.1% contamination threshold not being exceeded. This requires sampling of at least 3,000 plants throughout Wallonia.

Sampling began in spring 2007, with some 1,200 plants harvested. The remainder of the sampling is still in progress, as are the molecular analyses.

While awaiting the right time for sampling, the first few months of the project were spent in verifying the viability of various analytical choices (will a plant stored for one day in a plastic bag in a cool environment – cold box – still provide quality DNA?) The leaf material drying and crushing protocol prior to DNA extraction was tested. It was also envisaged that screening PCR analyses would be performed to detect transgenic rape lines in several plants simultaneously and it has since been shown that, despite the plants' different physiological states, it is still possible to detect one transgenic plant in one hundred by simultaneously analysing more or less equal amounts of leaf material from 100 plants. Collecting reference material for the main transgenic rape lines likely to occur was another challenge, because positive controls are needed in the analyses. The teams were trained in the use of GPS and rape plant recogni-

tion with the assistance of the Agricultural University Ecology Laboratory and the APPO association.

Apart from the 3,000 plants to be collected throughout Wallonia, broken down by areas where rape is grown, the project also focussed on sampling in the vicinity of the sites of former transgenic rape experimental plots in the region. The Federal Public Service (SPF) Public Health allowed access to the site data for the purposes of the project (the sites themselves cannot be disclosed, though).



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New non-profit association: PhytEauWal

In an endeavour to control water pollution by pesticides, Société publique de Gestion de l'Eau (SPGE), the Belgian plant protection products industry association (Phytofar) and CRA-W have together formed a not-for-profit association, PhytEauWal. The association's aim is to provide assistance to pesticide users (farmers, local authorities, park and garden contractors, etc.) and the appropriate public authorities in order to make every effort to reduce the impact of pesticides on natural resources, the environment and, specifically, in the context of protecting drinking water sources.

In concrete terms, the association's work will mainly comprise installing biofilters to reduce the impact of plant protection products on water quality and monitoring the results, providing guidance for sprayer users or owners, and organising awareness-raising and training campaigns within and outside agriculture.

The positions of President and Vice-president will be filled by the funding organisations (SPGE and Phytofar), with Bruno Hughebaert and François Henriet from CRA-W acting as Treasurer and

Secretary, respectively. Day-to-day management will be the responsibility of Carl Devleeschouwer.

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Left to right: Patrick Meeùs (CRA-W), Bruno Huyghebaert (CRA-W), Rémy Frère (SPGE), Alain Tabart (SPGE), François Cors (CRA-W), Jérôme Cogniaux (Phytofar), Olivier Pigeon (CRA-W), Carl Devleeschouwer (CRA-W), Bernard Demaire (PhytoDis) and François Henriet (CRA-W).

Accreditation for one of our laboratories



The Farming Systems Section has just been ISO 17025 accredited for the following analyses:

- starch determination in forage and crushed cattle feed (polarimetric method).
- water content/dry matter determination in forage and crushed cattle feed, and cereals and crushed cereal products (desiccation method).
- detection of the main potato viruses (PLRV, PVY, PVX, PVS, PVA and PVM) by the DAS-ELISA test (qualitative method) on potato leaves.

The heads of these laboratories are: R. Agneessens (forage and cattle feed analyses) and J.L. Rolot (potato virological analyses).

Accreditation is in line with CRA-W's quality policy. This is far from an isolated instance, since several of our laboratories are already accredited or certified (<http://www.cra.wallonie.be>).

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11 April 2008: Ninth Belgian Chemometrics Symposium
Ceremony including presentation of the D.L. Massart
Prize for Chemometrics

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The papers from the symposium '13th Carrefour des
Productions animales. Question mark over ruminant
farming: truths and untruths' are on our Website.

<http://www.cra.wallonie.be>