Wallonie recherche CRA-W

CRA-W info

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FEED AUTONOMY IN ORGANIC CATTLE FARMING

INCREASING THE LEVEL OF FEED AUTONOMY IS USUALLY CONSIDERED AS A PREREQUISITE FOR CONVERSION OF CATTLE FARMS TO ORGANIC FARMING. IN THIS CONTEXT, FEED AUTONOMY WAS ANALYSED IN ELEVEN ORGANIC CATTLE FARMS IN WALLONIA IN ORDER TO GENERATE TECHNICAL AND ECONOMIC REFERENCES FOR FARMERS.

European regulations, high feed prices, improvement in the quality of the final product, reduction of the environmental impact of the production system, compel and motivate organic farmers to achieve a high level of feed autonomy. However, this is not technically easy. It requires, in particular, properly managing the feed production capacity and the animal requirements, both in quantitative and qualitative terms, to maximize in fine the gross profit margin.

The present study was based on six dairy and five suckler farms. It enabled (i) initiating a detailed classification of self-produced fodders and concentrates under organic farming conditions, and (ii) characterizing the level of feed autonomy in Walloon organic cattle farms and its relationship with the achieved economic performances and the underlying technical features.

The average level of feed autonomy on the monitored farms was high, varying between 79 and 99%. The total cost of feeding, including the production and purchase of animal feed, decreases with the level of feed autonomy. Furthermore, farms with a high economic efficiency were found to have a level of feed autonomy of 90% or higher. However, the reverse was not always true; a farm with over 90% autonomy was not economically efficient. These observations suggest that reaching 90% autonomy is necessary but not sufficient to be economically efficient.

Three types of production systems with a high economic efficiency were finally described. The first type is based on polyculture, and has relatively high production levels (~ 5800 to 6500 litres of milk/cow/year, presence of a fattening house in suckler farms), combined with high levels of feed autonomy (94 to 99%). The second type is based exclusively on grass; it has relatively high production levels (~ 5000 to 5500 litres of milk/cow/year), combined with levels of feed autonomy from 90 to 93%. The third type is based on polyculture and has a relatively low production level (~ 4000 litres of milk/cow/year), combined with almost complete autonomy (purchase of minerals only).

In conclusion, we emphasise the importance of (i) knowing the quality of the on-farm produced fodders and possible concentrates in order to optimise their use, and (ii) adapting the requirements of the herd (size, level of production) to its feed production capacity (quality and yields) in order to achieve a level of feed autonomy of at least 90%.

Full results are available on the website http://www.cra.wallonie.be/fr/dossier-autonomie-alimentaire-en-elevage-bovin-biologique.

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APPLE POMACE, A MATRIX WITH MULTIPLE BENEFITS FOR PIGLETS IN POST-WEANING?

THE COMPOSITION OF APPLE POMACE MAKES IT A CHOICE FOOD RAW MATERIAL THAT ENSURES A SMOOTH, EFFICIENT PIGLET WEANING PROCESS, MAINLY DUE TO ITS ABILITY TO ENHANCE DIGESTIVE HEALTH.

The firts results of a trial on the introduction of apple pomace into the foodstuff of piglets in post-weaning and its effect on digestive health were presented in the CRA-W Info No. 58 (Autumn 2018). This is described as the result of a complex balance between the host (physical and immune barriers), its microbiota (resources used and produced by commensal bacteria and other bacteria that pass through the intestines), and its food (nutrients, additives, anti-nutritional factors ...). It was shown that a diet containing 4% apple pomace had a positive effect on the feeding efficiency of the animals, in spite of an increase in softer to liquid faeces, a problem known as loose stools. The occurrence of these stools required no pharmaceutical treatment under the experimental conditions applied. This observation on the stools is probably related to the effect of the matrix - the fibre profile of apple pomace - rather than a result of pathogens consequences. This leads to two realisations associated with the use of this raw material: loose stools do not necessarily require antibiotic treatment at the start of post-weaning, and hygiene in the boxes must be more closely monitored at the end of post-weaning.

The results of the microbiota test showed that they were enriched through the use of 4% apple pomace, in contrast to a diet containing only 2%. And a more diverse microbiota would have a rather beneficial effect on the health of the individual. Using the 4% apple pomace diet, the profile of the bacterial populations that gradually balance out in the digestive tract was beneficial for the piglet, and would constitute one of the elements that justify the improved performances. To assess the effect of apple pomace on overall digestive health, its effect on the piglet immune system must still be determined. The results are expected soon, but are theoretically favourable according to the literature.

Due to its high fibre and biomolecule content, apple pomace matrix therefore has much appeal and could represent an innovative strategy for weaning piglets. A dose effect has been highlighted. The favourable results obtained using 4% apple pomace, in terms of performance, intestinal morphology and microbiota, encourage the pursuit of further knowledge of the multiple modes of action of this matrix.

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FLAX FIBRE THREATENED BY A NEW PATHOGENIC FUNGUS

THE CRA-W PARTICIPATES TO A EUROPEAN PROJECT THAT AIMS TO PROTECT FIBRE FLAX FROM A NEW FUNGAL DISEASE BY MEANS OF BIOLOGICAL CONTROL.

Verticillium wilt is a fungal disease that affects many plants, including potato, beet, strawberry, maple and lime. This disease has recently been reported in fibre flax. The fungal pathogen, *Verticillium dahliae*, produces resistant spores that can survive for more than 10 years in soil. It infects the roots shortly after sowing, but it is during retting (a process that involves leaving the uprooted flax plants for 2 or 3 weeks on the plot before harvesting, to facilitate separation of the straws from the fibre, see photo) that the fungus degrades the fibre, making it unsuitable for the production of long fibres used in the manufacture of textiles.

Retting of fibre flax

There is currently no way to control the disease. The Pathoflax project, an Interreg cross-border project between France and Belgium, aims to help farmers to manage this new disease. It concerns the development of diagnostic methods, the identification of risk factors for disease development (cultivation practices), the characterisation of strains of the fungus, the assessment of biological control products (antagonistic microorganisms and elicitors) and the evaluation of flax varieties for their resistance to the disease. The project carried out at CRA-W aims to determine the extent of the problem in Wallonia, and to participate to the development of detection and quantification methods in soils and seeds. Other objectives include the evaluation of the aggressiveness of strains of the pathogen isolated from other host plants (notably potatoes) on flax, and the raising of Walloon farmers' awareness of this new disease.

The first results of the project (which started in January 2019) indicate that this problem is indeed prevalent in Wallonia. Levels of infection vary considerably from one plot to another. Surveys among farmers are ongoing to determine the relationship between the concentration of fungal spores in the soil and the yield of fibre. Tests designed to detect the fungus in soil and flax seeds have been validated. They will be proposed to farmers via the CRA-W plant clinic.

At the end of the project (2022), a decision support tool will be made available to farmers in France and Belgium, to help them better manage this new phytosantary threat.

Interreg V project granted by FEDER and Wallonia Public Service, agreement 1.1.350 PATHOFLAX

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INSTALLING A HOP GARDEN COLLECTION

IN RECENT YEARS, MANY MICRO-BREWERIES HAVE EMERGED IN OUR REGION. THIS RENEWED, GROWING INTEREST IN LOCAL HOPS IS PARTLY EXPLAINED BY THE DESIRE FOR 100% WALLOON PRODUCTION.

The CRA-W virology laboratory have been gathering varieties of aromatic and/or bitter hops since the 1980s. At that time the objective was to offer producers a greater diversity of hop varieties, enabling them to cope with the high susceptibility to verticillium wilt in the cultivars found in Belgium. A process of rapid multiplication by micro-propagation was thus developed. This made it possible to supply quality plants to producers in the Poperinge region, the main hop growing area in Belgium. Demand decreased between 2000 and 2010... but in recent years, we have been approached by individuals and amateur brewers wishing to obtain hop plants.

In response to this revival of interest, the CRA-W collection expanded in 2019 and now includes some 75 cultivars of traditional varieties and some of Belgian origin.

In order to demonstrate the potential of these diverse varieties, it was decided to install a mini hop garden on the site of the CRA-W's Marchal building, using 2 plants per cultivar. This was achieved with the technical help of a student from Ciney (Julien Hubert) and the Marchal building technical team. Two lines of coniferous wood poles measuring 7-8 m were erected and driven a metre into the ground. All metal hardware (wires, stretchers, etc.) needed to maintain the structure and allow the hops to be hung will be installed in the spring. Planting will take place in May-June, in the hope that some cones will even be ready for harvest this year; we will still have to wait 3 years before these hop plants perform at their best.

A few plants have already been installed on display near the entrance to the Marchal Building.

Amateur brewers take note...

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THE QUALITY OF POTATOES IN EVERY SENSE

THE CULINARY AND TECHNOLOGICAL QUALITY OF A POTATO GROWN FOR CONSUMPTION IS AN INDICATION OF ITS SUITABILITY FOR EATING, PREPARING OR PROCESSING ACCORDING TO AN EXPECTED USE. THIS IS A CRUCIAL DATA SET FOR MARKETING.

As with the production of other vegetables, the quality of potatoes is dependent on a series of factors, some of which relate to choices made by the producer (variety, crop management) and some of which do not (climatic conditions). To obtain a quality potato it is therefore essential to meet the final requirements expected for a given variety. This calls for detailed knowledge of production and conservation techniques, regular monitoring at the end of the cultivation period and uprooting under favourable conditions.

At the CRA-W Haute Belgique building in Libramont, a laboratory has been specialising, since the 1970s, in the development and implementation of sensory analysis dedicated to potatoes. This involves analysing the organoleptic properties of samples using the 5 senses: sight, smell, touch, taste and, in rare cases, hearing. What sets the laboratory apart is the wide range of analytical methods offered and the expertise of a team that can adapt to changing analytical needs. This is because, in the past fifteen years, the valuation of potatoes has become divided and diversified, with increasingly complex, specific demands: new potatoes, French fries, varieties for microwave cooking, etc.

In practice, the analysis is carried out by expert staff according to rigorous protocols developed at the CRA-W (assessment of sub-epidermal spots or «blue bruises», definition of 9 sensory descriptors) or more widely shared criteria (colour after frying). A tasting jury made up of CRA-W staff members has also been trained and is mobilised according to requirements.

The laboratory was originally established to meet the needs of the potato breeding programme of the time. On the one hand, the analysis currently forms part of the research programme: improving the potato, studying the impact of cultivation or conservation practices on quality, the description of new varieties; on the other hand, a number of private customers are requesting CRA-W expertise: mass distribution, specifications

of differentiated quality (Plate de Florenville), potato packers/preparers, producers, etc. As a result, 460 samples were analysed in this laboratory during 2019.

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TOWARDS A BETTER CONTROL OF THE GEOGRAPHICAL ORIGIN OF VIRGIN OLIVE OIL IN EUROPE

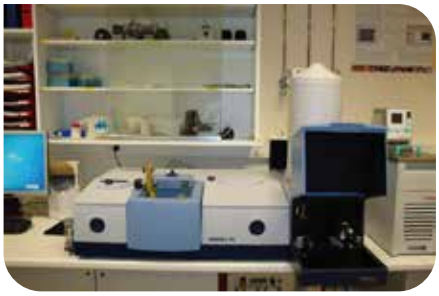
THE SUPPLY OF VIRGIN OLIVE OIL (VOO) OF WELL-DEFINED GEOGRAPHICAL ORIGIN IS ONE OF THE EXPECTATIONS OF EUROPEAN CONSUMERS. CURRENTLY, NO STANDARDS FOR GEOGRAPHICAL IDENTIFICATION HAVE BEEN ESTABLISHED BY REGULATORY BODIES.

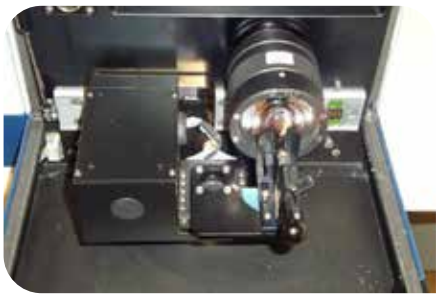
The EU project Food Integrity (grant agreement No. 613688) underlined the importance of determining the geographical provenance of virgin olive oil (VOO). Until now, there is no method established by regulatory bodies to be used as a standard for geographical identification. In this project, a complete evaluation to find the best analytical techniques for assessing geographical provenance was performed, taking into account important criteria such as detection range, limits (LDO, LOQ), cost, sensitivity, selectivity, etc. Moreover, a guideline for validating qualitative methods including statistical analysis was proposed.

Until now, chromatographic techniques produced good results but the protocol is time-consuming as it needs information from diverse chemical series that have to be analysed with different standard and in-house chromatographic methods. The need for faster methods, more adapted to active commerce, has driven to check the feasibility of non-targeted techniques determining VOOs from European and non-European producer countries as well as to know which one would be better positioned when analysing blind samples.

In this context, within the framework of the Food Integrity project and in collaboration with the Instituto de la Grasa (CSIC - Spain), a full study was launched to check the performance of rapid methods. In this context, the aim of the work performed by the CRA-W was to provide a strict evaluation of the Raman spectroscopy through a defined strategy for evaluating non-targeted methods for geographical identification (European and non-European VOOs) of olive oil samples as quality label.

For this reason, the application of chemometric tools (unsupervised PCA and supervised discrimination PLS-DA methods) based on the spectroscopic Raman data of the olive oil samples was performed. With unsupervised methods, trends in the spectral data were found allowing at the same time the selection of variables that could be responsible of possible separation/clustering. Three main Raman shifts were found corresponding to the presence of trilinolein, in line with previous scientific research. With supervised classification methods, classification rules were determined and were then applied to classify new (blind) samples.





FoodIntegrity (subvention 613688) : www.foodintegrity.eu

Raman spectrometer at the CRA-W and instrument to measure olive oil

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AGENDA

From 27 to 29 May 2020
The Bourse in Namur

PESTICIDES AND SUSTAINABLE AGRICULTURE, HOW TO RECONCILE THEM?

50th congress of the French Pesticide Research Group

Thursday 28 May, afternoon, debate open to the public

"WHAT ARE THE ALTERNATIVES TO SYNTHETIC PESTICIDES?"

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https://tinyurl.com/gfp2020

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