



Organic Food Quality & Health Newsletter June 2009

Edition No. 2/2009

Dear Reader,

With pleasure we present to you the second FQH newsletter of 2009.

The focus of the FQH Newsletter is to make information on topics, relevant to FQH, visible and easy to find.

In this Newsletter you will find a lot of information, from several Journals, from Organic E-prints and from some organisations related to FQH. We wish you pleasure and inspiration reading.

More information on Organic Food Quality and Health you can find on the FQH-website www.organicfqhresearch.org. We heartily thank the members who provide us with information. Contributions to a next Newsletter or to the Agenda can be sent to the FQH-coordinator: fqh@louisbolk.nl.

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Imprint

1 FQH News

1.1 Workshop on Concept Development and Strategic Research Agenda, 5 - 6 May 2009, Frick

On 5 and 6 May 2009 FQH members had an inspiring Scientific Workshop, hosted by FiBL, Switzerland.

In building a scientific community, since November 2008 one of the main themes in FQH is concept development: jointly discussing and thereby filling and defining terms that are relevant to organic food quality and health. In the first months of 2009 we focused on terms like 'organic food quality', 'authenticity', 'vitality', 'true nature', 'integrity', in a concept mapping process led by prof. Ton

Baars of Kassel University. In the first day of the Workshop several steps forward were made in the understanding of each other. We decided to work further on some new interesting terms which appeared to be not fully clear: 'inner quality', 'sustainable', 'holistic', to be discussed further in the second Member Workshop in November 2009 in Warsaw.

A second subject in the last year was the development of a FQH Research Agenda and, subsequently, contributing to the Strategic Research Agenda (SRA) of TP Organics of the IFOAM EU group. On the second day of the Workshop the key challenges of the SRA were discussed and research ideas within the area of these challenges were discussed.

In November 2009 a second FQH member Workshop will be organized, this time in Warsaw.

1.2 Open FQH conference on 'Organic Food Quality and Health Research' in 2011

On the 2009 General Assembly of FQH an open scientific conference was decided for. This conference will take place on May 18 – 20 2011 in Prague. The title will be "Second International FQH Conference on Food Quality and Health studies in Organic Farming".

2 Articles

2.1 Comparison of physicochemical, microscopic and sensory characteristics of ecologically and conventionally grown crops of two cultivars of tomato (*Lycopersicon esculentum* Mill.)

Ordóñez-Santos, Luis Eduardo; Arbones-Maciñeira, Enrique; Fernández-Perejón, José; Lombardero-Fernández, Matilde; Vázquez-Odériz, Lourdes; Romero-Rodríguez, Angeles

Keywords: tomato; ecological; conventional; cultivar; sensory; microscopy

Abstract:

BACKGROUND: Numerous studies have compared ecologically produced foods with conventionally produced competitors, with contradictory results. In this work we investigated the physicochemical, microscopic and sensory properties of two tomato cultivars (Lladó and Antillas), which were grown both ecologically and conventionally.

RESULTS: The physicochemical variables size, weight, firmness, total acidity, pH, total solids content, lycopene content and CIELab a^* , b^* , a^*/b^* , C^* and h^* were all significantly influenced by cultivar, as were the sensory variables external colour, internal colour, external aroma intensity and flavour persistence. Compared with conventionally grown tomatoes, ecologically grown tomatoes had larger total solids contents and larger values of the CIELab colour parameters b^* , C^* and h^* , but smaller sizes and weights and smaller values of the CIELab parameter ratio a^*/b^* ; however, these physicochemical differences were insufficient for growing method to have a significant influence on any of the sensory attributes that were evaluated. Microscopy showed the influence of cultivar on lycopene content, but no other structural differences were observed between the two cultivars or between tomatoes grown by different methods.

CONCLUSIONS: The statistically significant differences found in this study were mainly between cultivars rather than between tomatoes grown using different management practices. Copyright © 2009 Society of Chemical Industry

The full article is published in: [Journal of the Science of Food and Agriculture](#), Volume 89, Number 5, 30 March 2009, pp. 743-749(7). DOI: 10.1002/jsfa.3505.

2.2 Evaluating NIR instruments for quantitative and qualitative assessment of intact apple quality

Paz, Patricia; Sánchez, María-Teresa; Pérez-Marín, Dolores; Guerrero, José-Emilio; Garrido-Varo, Ana

Keywords: NIR spectroscopy; apple quality; non-destructive analysis; soluble solid content; firmness;

shelf-life

Abstract:

BACKGROUND: In recent years, near-infrared reflectance (NIR) instruments have undergone radical changes, becoming much more versatile, more portable, cheaper and better adapted to hostile working areas. In this study, three commercially available spectrophotometers were evaluated for the determination of quality (soluble solid content, firmness and shelf-life) in intact apples. The three instruments used, which differ primarily in terms of measurement principle and wavelength range, were a scanning monochromator (SM) with a range of 400-2500 nm, a combination of diode array and scanning monochromator (DASM) with a range of 350-2500 nm and a diode array (DA) with a range of 900-1700 nm.

RESULTS: A total of 334 apples (*Malus domestica* Borkh.), cvs Fuji and Golden Delicious, were used to build calibration models in different spectral regions and using various spectral signal pretreatments. The three NIR instruments evaluated provided good precision for soluble solid content, with r^2 values between 0.90 and 0.94 and standard error of cross-validation (SECV) values ranging from 0.51 to 0.68°Brix; however, firmness measurements were less precise in all three cases ($r^2 = 0.52-0.57$, SECV = 8.28-8.83 N). The performance of the three instruments in classifying apples by shelf-storage duration (0, 8 and 14 days) was studied using partial least squares discriminant analysis to develop classification models. A total of 86.1% of samples from the mixed-cultivar group were correctly assigned, compared with 86.6% of samples from single-cultivar groups.

CONCLUSION: The results obtained suggest that, in general, the three NIR instruments tested provided a similar level of accuracy for the measurement of soluble solid content, firmness and shelf-life, being slightly better the prediction models developed with the DASM spectrophotometer. Copyright © 2009 Society of Chemical Industry

The full article is published in: [Journal of the Science of Food and Agriculture](#), Volume 89, Number 5, 30 March 2009, pp. 781-790(10). DOI: 10.1002/jsfa.3512.

2.3 Effect of nitrogen fertilization on quality markers of strawberry (*Fragaria × ananassa* Duch. cv. Aromas)

Ojeda-Real, Laura A; Lobit, Philippe; Cárdenas-Navarro, Raúl; Grageda-Cabrera, Oscar; Farías-Rodríguez, Rodolfo; Valencia-Cantero, Eduardo; Macías-Rodríguez, Lourdes

Keywords: *Fragaria × ananassa*; strawberry; nitrogen fertilization; volatile compounds; amino acids; soluble carbohydrates

Abstract:

BACKGROUND: Nitrogen is an indispensable element for fruit metabolism and low or excessive N levels can affect the accumulation of the most important components that contribute to the flavour and aroma of the fruit. Among them, sugars, acids and volatile compounds can be considered quality markers. The objective of this study was to evaluate the effect of N fertilization on these quality markers of the fruit at two harvest dates.

RESULTS: Strawberry plants were grown in a hydroponic system and N was applied as $\text{Ca}(\text{NO}_3)_2$ at concentrations of 0.3, 3 and 6 mmol L⁻¹ in the nutrient solution. Total soluble solids, soluble carbohydrates, amino acids and organic acids and volatile compounds of the fruit were analyzed. The fruits produced at 3 and 6 mmol L⁻¹ N had higher contents of esters, soluble carbohydrates and amino acids. The hexanal content increased with the 6 mmol L⁻¹ dose. The effect of fertilization was more marked at the second harvest date.

CONCLUSION: The availability of N in strawberry plants affected the accumulation of quality markers. The fruits expected to have the best flavour and aroma, with both high levels of soluble carbohydrate and esters and low levels of hexanal, were obtained with 3 mmol L⁻¹ nitrate in the solution. Copyright © 2009 Society of Chemical Industry

The full article is published in: [Journal of the Science of Food and Agriculture](#), Volume 89, Number 6, April 2009, pp. 935-939(5). DOI: 10.1002/jsfa.3531.

2.4 Comparison of phenolic acids in organically and conventionally grown pac choi (*Brassica rapa* L. chinensis)

Zhao, Xin; Nechols, James R; Williams, Kimberly A; Wang, Weiqun; Carey, Edward E

Keywords: total phenolic content; HPLC; fertiliser; high tunnel; open field; greenhouse; insecticide; nitrogen

Abstract:

BACKGROUND: Field and greenhouse studies were performed to investigate whether organic production methods influenced levels of phenolic acid compounds in pac choi (*Brassica rapa* L. chinensis cv. Mei Qing Choi) compared with conventional cultivation.

RESULTS: In the field experiment, organic fertilisation (compost + fish emulsion) resulted in significantly higher phenolic concentrations compared with conventional fertilisation (NPK + CaNO_3) under both high tunnel and open field environments. Increased phenolics were accompanied by a significant reduction in plant fresh weight and dry weight, probably due to nitrogen deficiency. However, the elevated level of phenolics in organically grown pac choi could also have been due to confounding effects of nitrogen availability, insect attack and pesticide application. A follow-up greenhouse experiment further demonstrated a significant increase in phenolic compounds and a reduction in yield with organic fertiliser (vermicompost + fish fertiliser) relative to conventional treatment (slow release inorganic fertiliser). Preventive insecticide application did not affect the phenolic levels in pac choi under either organic or conventional fertilisation.

CONCLUSION: Given that higher phenolic content in pac choi was associated with low nitrogen availability and considerable yield reduction, research is needed to determine the extent to which phenolic compounds may differ in organic and conventional pac choi when nutrient levels are adjusted to produce comparable yields. Additional study is also warranted to determine the extent to which insect attack might contribute to elevated phenolic content in organic pac choi. Copyright © 2009 Society of Chemical Industry

The full article is published in: [Journal of the Science of Food and Agriculture](#), Volume 89, Number 6, April 2009, pp. 940-946(7). DOI: 10.1002/jsfa.3534

2.5 "That First Step -- Organic Food and a Healthier Future," A Critical Issue Report

Dr. Christine McCullum-Gomez, Dr. Charles Benbrook, Dr. Richard Theuer

The Organic Center, 90063 Troy Road, Enterprise, OR 97828

Abstract: Overweight, obesity and diabetes are collectively the nation's number one public health problem. Effective interventions are urgently needed, especially among children and adolescents, in order to improve human well being and to slow, and hopefully soon, reduce growth in health care costs.

This "Critical Issue Report" describes six ways that organic food and farming can contribute to reversing current trends in overweight, obesity, and diabetes.

But most important, the report explains why the conscious decision by individuals to purchase organic food marks a critical first step toward a healthier diet and lifestyle.

For many people, this first step is the beginning of a series of incremental changes with important, long-run health benefits for individuals, families, and society as a whole.

The full report can be downloaded at the website of The Organic Center: [That First Step -- Organic Food and a Healthier Future](#).

2.6 Growth Inhibition of Foodborne and Pathogenic Bacteria by Conjugated Linoleic Acid

Jae Il Byeon[†], Han Suep Song[†], Tae Woo Oh[‡], Young Suk Kim[‡], Byeong Dae Choi[§], Hong Chul Kim[#], Jeong Ok Kim, Ki Hwan Shim[†] and Yeong Lae Ha^{a*‡}

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Abstract: The influence of conjugated linoleic acid (CLA) on the growth of some foodborne and pathogenic bacteria was examined. A potassium salt of CLA (CLA-K) was tested against three Gram-positive strains (*Bacillus cereus*, *Staphylococcus aureus*, and *Streptococcus mutans*) and five Gram-negative strains (*Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Vibrio parahemolyticus*, *Klebsiella pneumoniae*, and *Proteus mirabilis*). CLA-K-mediated growth inhibition was evident for all tested strains, particularly the Gram-positive strains. The IC₅₀ value of CLA-K was 0.3 mM for *B. cereus*, 1.2 mM for *S. aureus*, and 0.3 mM for *S. mutans*, whereas the value was 1.2 mM for *K. pneumoniae*, 1.2 mM for *P. aeruginosa*, 1.8 mM for *S. typhimurium*, 1.8 mM for *V. parahemolyticus*, and 2.4 mM for *P. mirabilis*. The CLA-K delayed the growth of all the tested strains at lower CLA-K concentrations, but completely inhibited the growth at higher concentrations. All cells grown in the medium containing CLA-K contained CLA in their membranes and exhibited irregular cell surface and cell disruption, which were greater in Gram-positive than Gram-negative strains. Higher lactic dehydrogenase activity (LDH), protein content, and malondialdehyde (MDA) content were evident in Gram-positive strains than in Gram-negative strains. These results suggest that the broad spectrum of growth inhibition by CLA mediated through the lipid peroxidation of CLA in the membranes and in the medium.

The full article is published in: [Journal of Agriculture and Food Chemistry](#), Volume 57, Number 8, 2009, pp. 3164–317., DOI: 10.1021/jf8031167

2.7 Variations in Conjugated Linoleic Acid (CLA) Content of Processed Cheese by Lactation Time, Feeding Regimen, and Ripening

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Abstract: Dairy products are major sources of conjugated linoleic acid (CLA); thus, an increase in CLA content can improve the quality value of dairy products. The objective of this work was to determine the effects of lactation time, feeding regimen, and ripening period on the level of CLA in processed cheese. CLA content in milk varied with the period of lactation; high in spring (April and May, about 6.8 mg CLA/g fat) and relatively low in mid summer and winter (about 4.3 mg CLA/g fat). The effects of dietary regimen and ripening period were determined in milk, which was obtained from March to May. After aging for 4 months, the cheese made from milk obtained from cows fed on pasture contained relatively higher levels of CLA compared to cheese made from milk obtained from cows fed indoors (8.12 mg CLA/g fat vs 6.76 mg CLA/g fat), but there was no difference in 7 month-aged cheeses. In both pasture and indoor feeding, 7 month-aged cheeses showed higher CLA content than 4 month-aged cheeses. The contents of stearic acid (C18:0) and linolenic acid (C18:3) were significantly higher in cheese from pasture fed cows compared to those in cows fed indoors. These findings should be helpful for the efficient production of functional dairy products with high CLA contents.

The full article is published in: : [Journal of Agriculture and Food Chemistry](#), Volume 57, Number 8, 2009, pp. 3235–3239, DOI: 10.1021/jf803838u

2.8 Maturity Stage at Harvest Determines the Fruit Quality and Antioxidant Potential after Storage of Sweet Cherry Cultivars

Mara Serrano†, Huertas M. Daz-Mula†, Pedro Javier Zapata†, Salvador Castillo†, Fabín Guilln†, Domingo Martnez-Romero†, Juan M. Valverde† and Daniel Valero*†

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Abstract: Eleven sweet cherry cultivars were harvested at three maturity stages (S1 to S3) based on skin color and stored at 2 °C for 16 days and a further period of 2 days at 20 °C (shelf life, SL) to analyze quality (color, total soluble solids, and total acidity) and bioactive compounds (total phenolics and anthocyanins) and their relationship to total antioxidant activity (TAA), determined in hydrophilic (H-TAA) or lipophilic (L-TAA) fraction. For all cultivars and maturity stages, the ripening process advanced during postharvest storage with increases in color intensity and decreases in acidity, as well as enhancements in phenolics, anthocyanins, and TAA in both H-TAA and L-TAA, although important differences existed among cultivars. The results showed that sweet cherry should be harvested at stage S3 (4 days later than the commercial harvest date) since after 16 days of cold storage + SL, the highest antioxidant capacity was achieved for both H-TAA and L-TAA.

The full article is published in: [Journal of Agriculture and Food Chemistry](#), Volume 57, Number 8, 2009, pp. 3240–3246, DOI: 10.1021/jf803949k

2.9 High Tunnel and Organic Horticulture: Compost, Food Safety, and Crop Quality

Patricia Millner, Sara Reynolds, Xiangwu Nou, and Donald Krizek

Abstract: High tunnels and protected horticultural structures provide organic and conventional growers with an economic means for extending the harvest season of fresh fruits and vegetables in a wide range of climate zones in North America and elsewhere. This report focuses on benefits associated with high tunnel production of fresh organic produce, including recent data on phytonutrient quality. In addition, this report discusses concerns and knowledge gaps associated with the use of composts and manures relative to food safety of fresh produce and survival of enteric pathogens in the moist, cool, reduced ultraviolet conditions often prevalent in high tunnels during cool-season production. The role of preplant and production elements of Good Agricultural Practices and Good Handling Practices applicable to high tunnel systems is provided.

The full article is published in: [HortScience](#), Apr 1 2009: 242–245

2.10 Organic or Local? Investigating Consumer Preference for Fresh Produce Using a Choice Experiment with Real Economic Incentives

Chengyan Yue and Cindy Tong

Abstract: Determining consumers' preferences and willingness to pay (WTP) for organically grown and locally grown fresh produce is very important for stakeholders because it helps them figure out what type of fresh produce to grow and sell, what to emphasize in marketing efforts, and what are reasonable prices to charge. However, the literature that studies and compares consumers' preference and WTP for both organically and locally grown fresh produce is sparse. The objective of this study was to investigate consumers' WTP for organically grown and locally grown fresh produce and the marketing segmentation of these two types of produce. We combined a hypothetical experiment and nonhypothetical choice mechanism to investigate consumers' WTP for the attributes organic, local, and organic plus local for fresh produce. We found that when real products were used in the hypothetical experiment, the hypothetical bias (the difference between what people say they will pay and what they would actually pay) was not high. We found that consumers' WTP for the organic attribute was about the same as their WTP for the local attribute. Consumers' sociodemographics affected their choice between organically grown and locally grown produce. Furthermore, we found that consumers patronized different retail venues to purchase fresh produce with different attributes. The findings of the research have great importance for fresh produce stakeholders to make correct production and marketing decisions; the findings also contribute to experimental method choice in consumers' WTP research.

The full article is published in: [HortScience](#), Apr 1 2009: 366–371.

2.11 Residues of rotenone, azadirachtin, pyrethrins and copper used to control *Bactrocera oleae* (Gmel.) in organic olives and oil

Simeone, V.¹; Baser, N.¹; Perrelli, D.²; Cesari, G.¹; El Bilali, H.¹; Natale, P.²

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Abstract: Rotenone, azadirachtin, pyrethrins and copper fungicide decay curves were determined in olives and olive oil samples after experimental trials, consisting of one, two and three applications of each active ingredient, were carried out twice in 2005 and 2006. Rotenone, azadirachtin and pyrethrins were analyzed by extraction with acetonitrile and determined by liquid chromatography; copper was extracted into aqueous HCl and determined by chemical stripping. Pyrethrins were always found but in levels below the acceptable limits, whereas rotenone and copper residues always exceeded, after the pre-harvest interval, the maximum threshold allowed for olives. As regards residues in olive oil, rotenone was found in concentrations higher than those detected in olives. Copper accumulated in olives according to the number of applications, whereas, in oil, the residue was always lower than the maximum residue limit. The sensitivity of the method applied did not allow detection of azadirachtin.

The full article is published in: [Food Additives and Contaminants](#), Volume 26, Number 4, April 2009, pp. 475-481(7), DOI: 10.1080/02652030802562938.

2.12 Fusarium mycotoxin content of UK organic and conventional wheat

Edwards, S. G.1

1: Crop and Environment Research Centre, Harper Adams University College, Newport, UK

Abstract: Each year (2001-2005), 300 samples of wheat from fields of known agronomy were analysed for ten trichothecenes by gas chromatography-mass spectrometry (GC/MS) including deoxynivalenol (DON), nivalenol, 3-acetyl-DON, 15-acetyl-DON, fusarenone X, T2 toxin, HT2 toxin, diacetoxyscirpenol, neosolaniol and T-2 triol and zearalenone by high-performance liquid chromatography (HPLC). Of the eleven mycotoxins analysed from 1624 harvest samples of wheat, only eight were detected, and of these only five-deoxynivalenol, 15-acetyl-DON, nivalenol, HT-2 and zearalenone-were detected above 100 µg kg⁻¹. DON was the most frequently detected Fusarium mycotoxin, present above the limit of quantification (10 µg kg⁻¹) in 86% of samples, and was usually present at the highest concentration. The percentage of samples that would have exceeded the recently introduced legal limits varied between 0.4% and 11.3% over the five-year period. There was a good correlation between DON and zearalenone concentrations, although the relative concentration of DON and zearalenone fluctuated between years. Year and region had a significant effect on all mycotoxins analysed. There was no significant difference in the DON concentration of organic and conventional samples. There was also no significant difference in the concentration of zearalenone between organic and conventional samples, however organic samples did have a significantly lower concentration of HT2 and T2. Overall, the risk of UK wheat exceeding the newly introduced legal limits for Fusarium mycotoxins in cereals intended for human consumption is low, but the percentage of samples above these limits will fluctuate between years.

The full article is published in: [Food Additives and Contaminants](#), Volume 26, Number 4, April 2009, pp. 496-506(11), DOI: 10.1080/02652030802530679.

3 Organic Eprints

Below we offer you some papers and posters published in Organic Eprints:

3.1 Effects of feeding regime on milk fat composition: permanent grassland compared to maize silage (Einfluss der Fütterung auf die Milchfettzusammensetzung: Naturwiesenfutter im Vergleich zu Kunstwiesenfutter)

Wyss, Ueli and Collomb, Marius (2009)

Abstract: A trial was carried out to investigate the influence of forage from temporary or from

permanent grassland as well as permanent grassland supplemented with maize silage on the milk fat composition. The trial lasted seven weeks: two weeks of adaptation period and five weeks of experimental period. The forage was offered ad libitum in the stable. None of the cows received concentrates, only a mineral supplement was added. Both feed intake as well as milk production were recorded daily. Before the trial and three times during the trial milk samples were taken and in addition to the fat, protein and lactose content different fatty acids in the milk fat were analysed. The variant with the forage from the permanent grassland had, in comparison with the forage from the temporary grassland, higher proportions of unsaturated fatty acids and higher contents of omega-3 and of conjugated linoleic acid (CLA). With increasing age of the forage, the contents of omega-3 and CLA decreased. The addition of maize silage had a stronger influence on these fatty acids, as the lowest amounts of omega-3 and CLA were found.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009.
<http://orgprints.org/14054/>

3.2 Effects of conventional and organic diets on fertility traits in rabbits

(Einfluss von Diäten aus konventioneller und biologischer Erzeugung auf Fruchtbarkeitsparameter bei Kaninchen)

Bieber, Anna; Seidel, Kathrin; Wyss, Dr. Gabriela S.; Maurer, Dr. Veronika and Zeltner, Dr. Esther (2009)

Abstract: In order to test the effect of organic vs. conventional diets on fertility traits, we conducted an on-farm study with female rabbits. Eight groups of seven to eight female rabbits kept in systems with litter were fed ad libitum with either organic or conventional pellets. Offspring was weaned with approx. 28 days. In the first series analysed, the conception rate was higher in the conventional groups. Diet type had no significant influence on that trait. Nevertheless, a significant influence of diet on litter size was found: organically fed female rabbits produced more offspring per litter. The organic groups also showed higher rates of weaned animals, despite of a slightly higher mortality of offspring in these groups, but differences for both traits were not significant compared to conventional animals. Inconsistency of findings in the first series of this study concerning the effect of different diets on fertility traits were also found in literature. Data from the currently running second series will show whether the slightly positive effect of organic diet will become more evident.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009.
<http://orgprints.org/14097/>

3.3 Factors affecting allergy: Milk fat quality as a protecting measure against all egies. (Allergiezusammenhänge im Überblick: Milchfettqualität als schützende Maßnahme gegen Allergien.)

Baars, Prof Dr Ton and Jahreis, Prof Dr Gerhard (2009)

Abstract: Allergy in human populations is increasing due to modern lifestyle. Farm children and children with an anthroposophic lifestyle showed less allergic symptoms. This article describes the modern insights about nowadays nutrition and lifestyle factors impacting on the development of allergies and the research done in the 1920s about the health status of indigenous people and their eating behaviour. Many epidemiological studies mention the quality of farm milk, raw milk and milk fat as important factors to reduce the risk of allergies. It is explained why and how a high-quality milk fat in terms of conjugated linolenic acid and omega-3 long-chain fatty acids are influencing the cell physiology. These new insights will affect future strategies of organic dairy production and marketing in organic agriculture.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009. <http://orgprints.org/14108/>

3.4 Improvement of the sensory quality of parsnip (*Pastinaca sativa* L.) by on-farm progeny selection. (Züchterische Verbesserung der sensorischen Qualität der Pastinake (*Pastinaca sativa* L.) im Praxisbetrieb)

Horneburg, Bernd; Bauer, Dieter and Bufler, Gebhard (2009)

Abstract: Parsnip (*Pastinaca sativa* L.) is one of the few cultivated plants domesticated in Europe. The crop is underutilized and the number of available varieties is small in Central Europe. On-farm management of genetic resources can be an important means to increase infraspecific diversity, and to improve the quality of crops. In the present experiment quality-improvement by progeny selection on-farm was investigated. In a first step parsnips were selected for organoleptic quality by a technique that allows to harvest seeds from the plant tested. In a second step, progenies of positive- and negative-selected plants were compared with the original population. The experiment was carried out with the varieties Aromata (2006) and White King (2008) in biodynamic management. Organoleptic quality was determined according to a key developed for parsnip. Sugar contents were determined. Organoleptic selection significantly improved sweetness and flavor and can be recommended. However, selection was not efficient to improve texture.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009. <http://orgprints.org/14145/>

3.5 Standardisation of the 'Steigbild' method to distinguish samples of different origin. (Standardisierung der Steigbildmethode für die Unterscheidung von Proben aus verschiedener Herkunft)

Kahl, J.; Zalecka, A.; Busscher, N. and Ploeger, A. (2009)

Abstract: With the Steigbild technique patterns are produced on thin-layer chromatographic paper and evaluated as a fingerprint of the sample as a whole. To be applied in routine analysis the method has to be standardised according to international standard norms. The operating procedures were documented and a method for the visual evaluation was standardised. Then several factors of influence were tested and the reproducibility was investigated. The method is able to differentiate patterns from samples from different farming treatments and processing steps. Farm pairs of organic and conventional farm management can be distinguished as statistical significant and classified according to the farming system for carrot and wheat samples. This represents a significant step forward beyond the state of the art.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009. <http://orgprints.org/14185/>

3.6 Classification of organic and conventional plant products by determination of secondary plant metabolites. (Klassifizierung von

pflanzlichen Produkten aus ökologischem und konventionellem Anbau durch Messung sekundärer Pflanzenstoffe)

Roose, M.; Kahl, J. and Ploeger, A. (2009)

The content of secondary plant compounds in plants is influenced by various environmental factors. Cultivation and fertilization are factors which are characteristic for the farming system organic or conventional. Within a German governmental funded project (BÖL02OE170/F) carrot, maize and wheat samples from different farming systems (defined trials and farm pairs) are differentiated and classified using their polyphenolic and carotenoid contents and profiles, respectively. The samples from organic farming could be differentiated from samples which were conventionally grown as statistical significant for carrot and wheat samples in a two year repetition. The samples could be classified by both, polyphenolic as well as carotenoid profiles. The sum parameters only can not be applied for the differentiation and classification of the samples. Factors like cultivar and site have a strong influence on the classification. Therefore for the classification of the carrot samples according to the farming systems land site must be included.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009.
<http://orgprints.org/14186/>

3.7 Organization and correlati on of quantitative and qualitative data in the CORE-Organic QACCP Project (Organisation und Zusammenfassung quantitativer und qualitativer Messdaten im Rahmen des CORE-Organic QACCP Projektes)

Buscher, N.; Kahl, J.; Degert, A. and Ploeger, A. (2009)

Abstract: Projects which are dealing with the question of food quality (i. e quality management, authenticity) usually evaluate measurements, which result from the application of different methods, usually in different institutes, on the same samples. Usually each method/institute evaluates its data and the overall findings due to the existing hypothesis are condensed in the project report. The data remain at the institutes. When the hypothesis develop, the data of the other partner institutes are not, or not easy accessible, to test the new hypothesis. A numerical method comparison and a multivariate statistics on the data is not possible. As a result of our BLE170 project, we included the development of a data-organization in the following BLE170/F project. This had as the goal to merge the data from different methods/institutes in one data file which should be accessible for evaluation by all the partners of the project. The question of publication rights was connected to a Non Disclosure Agreement (NDA). Simple statistical evaluations were done, like correlation between the methods, to check for comparable methods. These results were accessible through a user/password protected web site. In the Core-Organic 1885 project we are adapting the data integration system to the needs of this project, upgrading the existing software from only developer usable to a maintainer usable status. The work presented here describes how the data integration is organized (data format, data merging and evaluation) within the Core-Organic QACCP project.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009.
<http://orgprints.org/14280/>

3.8 Evaluation of grape juice with the three picture forming methods biocrystallisation, capillary dynamolysis and circular chromatography (Untersuchung von Traubensaft mit den drei Bildschaffenden Methoden Kupferchloridkristallisation, Steigbildmethode und Rundfilterchromatographie)

Fritz, Dr. Jürgen; Meißner, Georg; Athmann, Miriam and Köpke, Prof. Ulrich (2009)

Abstract: Ten encoded grape samples from 2006 were taken from a long-term field trial on the comparison of different organic and conventional production systems at Geisenheim, Germany. The samples were examined with the picture forming methods biocrystallization according to Pfeiffer, capillary dynamolysis according to Wala and circular chromatography according to Pfeiffer. The pictures of the encoded samples were i. differentiated and ii characterised. Two encoded samples of each of the five production methods 'conventional', 'bio-organic', 'bio-dynamic without horn silica', 'bio-dynamic with three horn silica applications' and 'bio-dynamic with four horn silica

applications' were clearly differentiated with highest accuracy, i.e. 100%.

Paper presented at 10. Wissenschaftstagung Ökologischer Landbau, Zürich, 11.-13. February 2009.
<http://orgprints.org/14283/>

3.9 Safe and adapted production of organic meat and sausages without, respectively with the reduced use of curing substances. (Leitfaden zur angepassten Herstellung von Öko-Fleisch- und Wurstwaren ohne bzw. mit reduziertem Einsatz von Pökelfstoffen)

Beck, Alexander; Binder, Cordula; Dylla, Renate; Liebl, Boris; Lücke, Friedrich-Karl and Frank, Wörner (2008)

Abstract: A manual for meat processing technicians and stakeholders in production companies has been generated by means of the project 06OE007 „Safe and adapted production of ecological meat and sausages without, respectively with the reduced use of curing substances“. This project has been patronised by the German federal programme Organic Farming.

The purpose and aim of this manual is to provide manufactures of products free of nitrite and nitrate respectively with reduced use of these substances with a support and adapted technology. The manual is highlighting crucial measures and the corresponding solution methods.

The manual is written in German and divided into three chapters:

Chapter 1 comments on the difficulties when producing without, respectively with the reduced use of nitrite and nitrate and explains where to pay attention when considering the microbiological and sensorial aspects and which measures have to be taken into account in general.

Chapter 2 covers at length the manufacturing of the individual products (raw, boiled, cooked sausages, raw and cooked cured products as well as preserves) stating precise key figures.

Chapter 3 deals with further specifications about overall relevant topics like quality management, calculation of the F-value, slicing and packing, storage and procedure of durability tests, handling of spices and antioxidant additives.

Report, Forschungsinstitut für biologischen Landbau (FiBL Deutschland e.V.), D-Frankfurt.
<http://orgprints.org/14275/>

4 Related organisations

Below we offer you some information from other organisations that are related to FQH:

4.1 The Organic Centre

4.1.1 2009 AAAS Symposium “Living Soil, Food Quality, and the Future of Food” Panelists Statement of Conclusions”

Dr. Preston Andrews, Washington State U, Dr. Jerry Glover, The Land Institute, Dr. Alsyon Mitchell, Univ. Calif. -Davis

"A growing body of sophisticated research over the last decade has compared the impacts of organic and conventional farming systems on soil and food quality. Based on this body of research, some of it carried out in our field experiments and laboratories, we can conclude that

1. Studies of apple production demonstrate that organically farmed soils display improved soil health as measured by increased biological diversity, greater soil organic matter, and improved chemical and physical properties. Enhancement of soil quality in organic apple production systems can lead to measurable improvements in fruit nutritional quality, taste, and storability.
2. Organically farmed tomatoes have significantly higher levels of soluble solids and natural plant molecules called secondary plant metabolites, including flavonoids, lycopene, and Vitamin C. Most secondary plant metabolites are antioxidants, a class of plant compounds that have been linked to improved human health in populations that consume relatively high levels of fruit and vegetables.

3. Organic farming can, under some circumstances, delay the onset of the “dilution effect.” In hundreds of studies, scientists have shown that incrementally higher levels of fertilizer negatively impact the density of certain nutrients in harvested foodstuffs, hence the name, the “dilution [of nutrients] effect.” Specifically, tomatoes grown with organic fertilizers maintain constant concentrations of beneficial phenolic secondary plant metabolites and antioxidants, even as fruit grow larger, whereas concentrations of these same beneficial compounds decline with increasing fruit size when the same tomato cultivar is grown using conventional methods and fertilizer.
4. Studies of 27 cultivars of organically grown spinach demonstrate significantly higher levels of flavonoids and vitamin C, and lower levels of nitrates. Nitrates in food are considered detrimental to human health as they can form carcinogenic compounds (nitrosamines) in the GI tract and can convert hemoglobin to a form that can no longer carry oxygen in the blood.
5. The levels of secondary plant metabolites in food appear to be driven by the forms of nitrogen added to a farming system, as well as the ways in which nitrogen is processed by the biological communities of organisms in the soil. Compared to typical conventional farms, the nitrogen cycle on organic farms is rooted in substantially more complex biological processes and soil-plant interactions, and for this reason, organic farming offers great promise in consistently producing nutrient—enriched foods.
6. Organic soil fertility methods, which use less readily available forms of nutrients, especially nitrogen, improve plant gene expression patterns in ways that lead to more efficient assimilation of nitrogen and carbon in tomatoes. This improvement in the efficiency of nutrient uptake leaves plants with more energy to produce beneficial plant secondary metabolites, compounds that promote plant health as well as human health.”

([The Scoop, March. 2009.](#))

4.2 IFOAM:

4.2.1 IFOAM EU urges to take advantage of EU’s most successful agricultural quality scheme: organic production



Prague, 12/03/2009 - Organic is the most successful EU food quality scheme – it combines high quality products with delivering an array of public goods.

Despite the financial crisis a still booming organic sector offers excellent opportunities for farmers and food processors, in a way that is good for rural jobs, for the environment and for climate change, and producing food that consumers want. On the occasion of the high level conference of the Czech EU Presidency on Agricultural Quality Production the IFOAM EU

Group urges policy makers to use this potential through a proper, quality-minded policy.

Opened by EU Agriculture Commissioner M. Fischer Boel, the conference followed the Commission’s Green Paper on EU Agriculture Products Quality Policy.

The IFOAM EU Group was present at the conference through its President Francis Blake, who delivered a speech during the first day of the event, and its Director Marco Schluter. The speech and the presentation of Mr Blake are available [here](#).

5 Agenda

☞ **Second FQH member Workshop 2009 in Warsaw**

Date: November 2009, exact date to be confirmed.

Location: Warsaw

Subject: Continuation of and further steps in the Concept Mapping process. For more information please contact the FQH coordinator at fqh@louisbolk.nl.

☞ **Open FQH Conference on ‘Organic Food Quality and Health Research’**

in 2011

Date: May 18 – 20 2011

Location: Prague.

Title: "Second International FQH Conference on Food Quality and Health studies in Organic Farming".

Imprint

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