

Fact sheet on Organic RDD-2 projects.

Background: the seven projects below will receive funding for the first 67 million DKK out of the total 120 million DKK set aside for organic research and development 2013-2015. The focus areas in the seven projects are based on [ICROFS' Research and Development Strategy 2012](#).

Project VIPiglets: Low mortality through birth of vital piglets

Piglet mortality in Danish organic pig production is very high with one of three organic piglets dying before weaning. This is a major barrier for obtaining a predicted high growth potential for organic pig production. The high mortality rate seems to be related to litter size beyond the size that can be fostered by the sow and birth of weak pigs. The current breed combination may be less suited for organic production, where sows farrow in in-accessible hutches, having long lactations and with limited possibilities for managing surplus piglets. The project facilitate a reduction in neonatal organic piglet mortality from 33 to 20 % of total born piglets, one extra weaned pig per litter and a one extra kg in average weaning weight. Implementation of these results will increase societal trust in organic pig production due to improved animal welfare. The project will 1) through observational studies in Danish organic herds identify major mortality risk factors at the sow and piglet level 2) new breeding goals and selection tools to target the specific conditions and challenges of the organic sow production and 3) improved environment including access to and methods for birth surveillance and assistance and provision of suitable climate for sow and piglets at the birth site. Finally, best management practice will be demonstrated and knowledge from the research part of the project will be disseminated through consultancy practice, workshops, web pages and written reports.

Funding: 10 million DKK

PROTECFRUIT: Protected production of organic apples and pears

The purposes are to increase the yield and area with organic apples/pears by new technologies, to create new business opportunities for technical equipment, to reduce use of resources as well as easier access to organic fruit produced with respect for the principles of organic farming. The yield in organic apple and pear orchards is less than of third of the conventional due to pests, diseases and smaller fruit, despite frequent sprays with 'natural' pesticides. In order to reduce spraying and increase the yield, protection of the trees by rain roofs has shown promising effects on fungal diseases. However, the microclimate under the rain roofs is altered and affects plant growth and quality. A novel technique is sprinkler spraying, where sprinklers are positioned at different heights in the tree row. Sprinklers may allow successful disease control with few curative potassium bicarbonate sprays instead of several preventive sulphur sprays. Sprinklers can also be used for release of scab ascospores by strategic irrigation in dry weather. Pests like the rosy apple aphid and pear gall midge reduce fruit yields considerably. Flower strips as a source of natural enemies to control the rosy apple aphid, and biological control of gall midge larvae by new formulations of entomopathogenic fungi will be studied. The effect of postharvest hot water treatment and monochrome light on wax and secondary metabolites will be studied to minimise waste during storage. Results from the project will be shared with the hort-industry by the advisory service.

Funding: 12 million DKK

MultiChick: Diversity and integrity in organic poultry meat production

Multi Chick aims to contribute to the growth in organic broiler production through a re-evaluation of production systems. The price of organic broilers is significantly higher than conventional, so a high degree of credibility is needed to increase the low market share of less than 0.8%. Therefore, it is inappropriate that the current organic production has problems with animal welfare and is dependent on foreign and conventionally produced protein and hatching eggs. There is a need for systems that are more protective of

the ecological principles and the expectation of high animal welfare and positive effect on the environment and climate. Efforts will be directed towards new feeding strategies in the existing systems and the development of new systems where new phenotypes, integrated in the production of willow/crops in order to achieve reduced N leaching, increase carbon storage and optimal welfare, which can provide a basis for launching new brands. It will provide additional value if there across the various systems is created concept feed based on Danish ingredients and if the hatching eggs produced organically in Denmark and thus provide the sector with multiple genotypes. The project is expected to identify barriers and opportunities throughout the chain from farm to table and make suggestions for how food chains for organic highquality chickens should be established so that the momentum of the sector ensured.

Funding: 7.1 million DKK

pECOSYSTEM: Pig production in eco-efficient organic systems

The project will support development of a trustworthy, resource efficient and competitive organic pig production in Denmark. The objective is to investigate, develop and demonstrate an alternative to the current practice. Today the climate and environmental impact of organic systems does not differ much from conventional, in fact the outdoor sow production imposes a significant risk to nitrate leaching. Further, hygiene and ammonia emissions are often difficult to control satisfactorily in the present stables with a connected concrete outdoor area, and diarrhea is a common problem when piglets are transferred from the range to the stables. Alternatively the sow production could take place in an agroforestry system expected to reduce nitrate leaching. The weaning could be postponed while maintaining the overall pig production per sow through introduction of lactation oestrus resulting in more robust piglets. Finishing could take place in new types of stables with significant lower ammonia emission while maintaining the health and welfare of the slaughter pigs. This cross-disciplinary project will document such possible benefits and develop management procedures to allow a profitable production based on these ideas. The expected effect is that the organic pig production can be expanded because of a better compliance with consumer expectations to the production and with societal expectations regarding the contribution of organic production to reduce environmental impact. This will increase the value of the primary pig production.

Funding: 8.9 million DKK

RobustFish: New possibilities for growth and robustness in organic aquaculture

RobustFish will strengthen the development of Danish organic trout production. According to the EU Regulation on Organic Aquaculture, the fish production shall exclusively be based on organic fry from 2016. Particularly, in organic farming, medication is only allowed within very strict limits. Therefore, the robustness of the fry to diseases is crucial. Especially, this concerns the most serious trout fry disease in Danish aquaculture, Rainbow Trout Fry Syndrome (RTFS). The robustness of the fry seems to be related to larval developmental rate and to the dietary content of specific Ω -3 fatty acids (HUFAs). Stress and RTFS tests are going to be performed to investigate if these two factors can be included in strategies to increase the robustness of the fry. Further, the effect on health and welfare of water treatments using approved agents in organic aquaculture is tested. RobustFish will create growth – based on organic principles and in a balance between environment, ethics and economy. However, the efforts will as well improve the productivity of the conventional trout farming by lower prevalence of RTFS, reduced medication and lower environmental impact. Connected to these efforts RobustFish also will provide needed knowledge about market conditions and consumer attitudes, including the competitive effect of increased production. Mapping the existing types of organic aquaculture products in European markets will pave the way for product development and increasing the Danish market share.

Funding: 8.7 million DKK

SOBcows: Specialized organic breeding goals and breeding schemes for dairy cattle

The overall aim of the project is to increase the volume and profitability of organic milk production by: 1) Adjusting the breeding stock and production animals to organic production systems. The knowledge gained from genomic selection is here utilized in order to establish organic breeding lines based on the existing Danish dairy breeds. 2) Providing sustainable methods for an organic niche production based on animals with specific genetic characteristics and animals from the native Danish dairy cattle breeds. Overall, the project will strengthen the credibility of organic dairy production as animals from the organic lines will have a higher genetic level with respect to health and welfare traits relative to the conventional lines. Establishment of organic lines with special breeding characteristics and use of genetic material from the native Danish breeds will furthermore contribute to sustainable management of animal genetic resources in the form of a much larger genetic diversity among organic livestock. The project will be carried out as theoretical simulations of breeding plans as well as a practical evaluation of the recommendations.

Funding: 7.4 million DKK

RowCrop: Row cropping in organic arable farming for increased productivity and sustainability
The main challenges for achieving higher and more stable yields in stockless organic farming relate to providing sufficient N supply and controlling competitive weeds. RowCrop will develop, evaluate and demonstrate a new row cropping that takes advantage of the latest developments in vision and GPS guided row cultivation systems by effectively integrating traditional arable crops with row cultivated legume-based catch crops and targeted weed control. RowCrop will develop the scientific foundation for improved control of aggressive annual and perennial weeds in a row cropping system and for cultivating more productive N fixing catch crops to enhance crop N supply. It will document the effects of the row cropping system on productivity, weed infestation, N cycling, N leaching and soil carbon in a long-term crop rotation experiment representing different organic crop rotation systems and different fertility and weed infestation levels. It will further demonstrate and disseminate results to advisors and farmers using field trials, open field days, workshops etc. The expected annual effects are: Economy: Yield increase of organic cereals of 1.2 ton/ha (100 million DKK). Environment: Reduced nitrate leaching of 10 kg N/ha (500 ton N). Climate: Enhanced soil carbon storage of 200 kg C/ha (37,000 ton CO₂). In addition the results are expected to pave the way for phasing out import of conventional manure in organic farming and for an enhanced conversion from conventional to organic farming.

Funding: 12.5 million DKK