



**Picture: Piglets with access to some additional pasture during the suckling period (Photo: Jascha Leenhouders)**

Previous results in this subproject have shown it is possible to breed for heat stress resistance, which is especially relevant where sows are kept outdoors in hot climates. The (genetic) effects of heat stress on farrowing rate were investigated and subsequently submitted for publication in a scientific journal.

The effects of rearing environment on mothering ability of sows as well as pre- and post-weaning diarrhoea and piglets losses are being investigated. The first mothers from conventional and organic rearing systems have now given birth to their first litters. These litters received 1) no outdoor run, 2) a standard concrete outdoor run with concrete floor or 3) an outdoor run with concrete floor and additional pasture for the piglets. Maternal behaviour, piglet mortality and gastro-intestinal health of piglets during the rearing period are being monitored over the next two years. One of the goals of this subproject is to determine the effect of pig breed and feeding regimes on nutritional and/or sensory quality characteristics of fresh and processed pork meat. In a trial focused on air-dried sausages, 72 animals were slaughtered in the first week of July 2011 with chemical analysis of meat, sausage preparation and testing in process finishing at the end of 2011. The remaining data sets concerning performance, carcass and meat quality are completed.

#### Outlook with regard to next period

A consultation workshop "How to create a market around local breeds" involving producers, processors and pork supply chain stakeholders will be organised in 2012.

The effects of heat stress in sows on litter size will be investigated. Focus will be especially on identifying the most heat-sensitive period during gestation.

A survey of fat quality (e.g. fatty acid composition, fat soluble antioxidant content and/or skatole) of pigs carcasses produced in low input and organic systems in three different macroclimatic zones will commence in January 2012. Protocols for sample collection are being finalised and we are about to liaise with other partners in this subproject to collect the first of the seasonal sample in January (others will follow in May and August 2012).

Regarding the effects of breed and feeding regime on the quality of air-dried sausages, the second and final trial began in October 2011, again with a total of 72 castrates aiming to start slaughter in March 2012.

### Subproject 4: Laying hens<sup>19</sup>

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#### Report for the period April 2011 to October 2011

In our search for an ideal hen suited to free range and organic systems, we started farm visits (40 farms in Switzerland, France and The Netherlands each) to get better insight into variation in management and actual condition of the hens with regard to feather cover, breast bone and foot pads.

In the earlier article in this newsletter "Free range and organic farms and farmers: do they differ?", we give a first impression on variation in management described by the farmers in the (telephone) interviews.

It is difficult to get a precise view on feather condition from farmers' judgement and there are indications that hens that can freely move around (as in free range and organic systems) have a rather high risk on

<sup>19</sup> The work packages of subproject 4, laying hen production systems:

Work package 4.1 Development of 'FARMER PARTICIPATORY' breeding systems to improve productivity, health and welfare and egg quality related traits; comparing standard with farmer participatory breeding systems

Work package 4.2 Effect of, and interactions between, laying hen genotypes, feeding regimes, 'welfare-friendly' moulting protocols and prolonged use of layers on performance, and animal health and welfare

Work package 4.3 Effect of, and interaction between, laying hen genotypes and management innovations on egg quality

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damaging their breast bone and foot pads. These health parameters are therefore recorded during farm visits when hens are in the second half of their productive life at about 45 weeks of age. In addition we collect information on management and nutrition and try to find best practices with regard to productivity, health management and behaviour. Farm visits are now more or less half way.

Besides overall performance we also want to get insight in egg quality. High levels of unsaturated fatty acids are desirable for human nutrition and we know egg fatty acid composition is very dependent on nutrition of the hens. During the visits we look for farms with interesting contrasts in diet (such as feeding of roughage) that might cause differences in egg quality. Subsequently eggs from these farms will be analysed for fatty acid composition to add to other assessments of egg characteristics (egg weight, cracked or dirty shells, and yolk colour) to optimize management for egg quality.

Until now the number of flocks retained to lay beyond 80 weeks is very limited and in Swiss farms with a prolonged laying period or with a moulted flock health data are examined to get insight into the health risks of such practices with special attention for intestinal parasites. The study includes 10 flocks on 3 farms. Feed prices and egg market situation as well as the condition of the flocks themselves will determine if additional farmers want to moult or keep the hens for an extended laying period.

In workshops farmers clearly indicated, they thought free range and organic systems require a heavier hen with greater eating capacity compared to conventional systems. Institut de Sélection Animale (ISA), a Hendrix Genetics company, is able to provide an experimental cross (hybrid) expected to be 10 % heavier than typical genotypes used for egg production. Currently a number of hens of this experimental cross are being raised on an organic farm in the Netherlands. At 17 weeks of age (end of 2011) the hens will be distributed to 6 to 7 mainly organic farms in The

Netherlands for testing during the laying period. Dependent on the results during rearing a second batch may be tried for further experimenting.

If other genotypes (crosses) appear, that might be suitable for free range and organic farms, we will also try to incorporate those in the testing program with farmers that volunteer for testing those genotypes. Where possible, there will be an on-farm comparison with conventional genotypes.

Nutrition of free range hens in general and organic hens in particular was discussed with organic feed manufacturers to evaluate genotype x diet interactions and optimise diets with regard to feather pecking and other production traits. When the LowInputBreeds project was planned, it looked feasible to experiment with diets containing meat and bone meal, often said to reduce feather pecking to some extent. Currently the decision to allow non-avian meat and bone meal for poultry diets seems to be further away. Moreover, until very recently the EU target of 100 % regionally produced organic ingredients for organic animal diets was due to start in January 2012. However, for laying hens it would then be extremely difficult to formulate an adequate diet and on October 3<sup>rd</sup>, it was decided to delay these demands. The uncertainty over the expectation for organic diets has delayed the testing of alternative diets for free range hens and discussions with the feed manufacturers have been reassumed.

So, overall we have been working on several parts of our work package: better insight in management practices, testing a new genotype, setting the base line for exploration of health of hens with a prolonged laying period, looking for interesting contrasts in management and feeds that influence egg quality and start-up of (field) tests with alternative dietary composition. A scientific paper on performance of different layer genotypes under organic and free range conditions has been submitted and is currently under review.