

## SusPig: Feeding pigs with local resources: our work at ITACyL and INIA in Spain

Selection of modern pig breeds has greatly increased production per pig over the past few decades. Pigs are leaner, in response to the demand by weight-concerned consumers. Pigs grow considerably faster, reaching slaughter weight in less time, resulting in an economic benefit because of a reduction in daily fixed costs associated with keeping a pig in a pen, such as labor and electricity. Furthermore, pigs reach this slaughter weight on a reduced amount of cumulative feed intake, therefore, modern pig breeds are highly feed efficient. This is especially important since feed accounts for up to 85% of total livestock production costs, bringing about further economic benefits of using improved genetics. However, the improvement in production efficiency did not come from genetic selection alone. Whereas genetic selection can improve a breed's production potential, it is the quality of feeds that will provide the animal with the means to express this. Even though pigs from lines that are genetically highly feed efficient need less feed, it needs to be of optimal quality. As a consequence, pig breeding is closely accompanied by pig nutritionists who investigate the pig's nutrient requirements, and by the feeding industries that formulate diets of optimal nutritional composition. On one hand, feeding pigs precisely with what they need to grow reduces feed waste and all the resources that went into producing this wasted feed, therefore increasing sustainability of pig production. On the other hand, however, using high quality feeds that contain ingredients such as cereals, results in a huge loss of potentially human edible calories when these are first converted into animal products, thus greatly reducing the number of people than can be fed per hectare. In addition, some 85% of the protein supplement fed to pigs comes from soybean meal because of its high protein content, but since Europe hardly produces soy, it is sourced from international markets, such as Argentina, Brazil, or the US. For example, in 2017, Spain produced about 5100 tons of soy on 1600 hectares, but this amounts to no more than 0.15% of Spain's soy consumption.



Alternatively, pigs can be fed on feed sources that are produced locally, however, these locally produced alternatives often are of lower nutritional quality, with lower protein or higher fiber content. In addition, they may have anti-nutritional factors that reduce the pig's ability to optimally use the feed's nutrients, and which may also result in less palatable feeds thus reducing feed intake and production. This means that, whereas including local feedstuffs increases sustainability of pig production, it will steer away from obtaining optimal production efficiency with optimal feed formulations that are required to feed highly productive and feed efficient commercial pigs. It is the aim of ERANET SusPig ([www.suspig-era.net](http://www.suspig-era.net)) to evaluate if feed efficiency can be sustained with more reliance on local feed resources or if a

different type of pig is required to perform in a different production system. In Spain, the Castile-Leon Agriculture Technology Institute (ITACyL) is evaluating and selecting several varieties of local legume crops aimed at increasing their production and nutritional quality and reducing the presence of anti-nutritional factors. At ITACyL, together with the National Institute for Agricultural and Food Research and Technology (INIA), we have chosen two legume varieties, *Vicia narbonensis* L. (Narbon vetch, or 'alberjón') and *Lathyrus cicera* L. (chickling pea or 'titarro'), to investigate the production characteristics of pigs from a local cross, Duroc × Iberian, at different levels of inclusion (0, 5, 15, and 20%). During the production phase we investigate their feed intake, growth, feed efficiency, fecal microbial composition,

and physiological parameters measured in blood. Preliminary results indicate that inclusion of Narbon vetch initially reduces feed palatability, resulting in reduced intake and reduced growth. However, when pigs get used to the new diet, both intake and growth are similar to that of pigs fed a regular soy-based diet. Also, feed efficiency is practically sustained at different levels of inclusion albeit at times resulting from lower production levels. Of importance after the production phase is whether the pork products also taste good. We have tested this by presenting slices of a typical Spanish pork product, cured loin, from pigs fed 0 or 10% Narbon vetch to untrained consumers and asked them to rate the taste. The results have not been formally analyzed, but on first sight it seems that the rating of 10% Narbon vetch loins is not significantly different from loins from pigs fed a regular diet. A taste panel rating the taste after 20% inclusion of Narbon vetch will take place at a later time. Also, the experiment on chickling pea is still ongoing.



Interested in following the results? They will be uploaded here as soon as they become available (see "References"): <https://www.researchgate.net/project/Sustainability-of-pig-production-through-improved-feed-efficiency-ERA-NET-SusAn-35-SusPig>.