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INTERVIEW: New EU Project Hopes to Use Coffee By-Products to Feed Dairy Livestock

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8 December 2020 - A new project led by Spanish food research centre AZTI, funded by the Life Environment and Resource Efficiency programme of the European Commission, is hoping to illustrate the viability of using spent coffee grounds as an alternative feed raw ingredient for dairy cattle and sheep at a semi-industrial scale.

With livestock production in Europe forecast to increase by 70 % by the year 2050 the LIFE ECOFFEED project is hoping to develop and demonstrate, at real-scale, the potential of using coffee by-products as an alternative to raw animal feed, to help Europe keep up with feeding its burgeoning dairy livestock herds.

David San Martin

AZTI Researcher

EU Life ECOFEED Project

Feedinfo spoke to David San Martin, researcher at AZTI and one of the team members involved in the project, to give us an overview of the project's aspirations and the feasibility and practicality of using coffee by-products in lieu of more traditional raw feed ingredients.

European coffee consumption is estimated at 2.67 million tonnes per year, and is responsible for the production of about 5 million tonnes of wet spent coffee grounds (SCGs) annually, San Martin told us. He went on to say that half of that SCG (2.5 million tonnes) will find itself in landfill, despite having the potential to be used in the feed industry.

However, according to San Martin "if that amount of wet SCG was processed to produce an ingredient for animal feed, about 1.25 million tonnes of SCG ingredient (8 % of moisture) will be produced in the EU." A large quantity of animal feed for a product that otherwise would have found itself in landfill.

During the project, the team is expecting to produce over 10 tonnes of animal feed ingredient from SCG sourced from northern Spain (Basque Country and Navarre) and southern France (Aquitaine) to assess the technical and economic viability of large-scale introduction of the concept.

The overall goal of the Life ECOFFEED project is to demonstrate the use of SCG for animal feed at a semi-industrial scale, in real operational conditions, in a representative EU region to reach a Technological Readiness Level (TRL) of 7, San Martin told Feedinfo.

He went on to explain that "within this framework, the selection of the EU countries where we develop, demonstrate, replicate and transfer the proposed solution will be carried out based on coffee consumption and dairy livestock activity:"

Based on that framework San Martin says with regard to SCG production "Germany, Italy, France and Spain are the most important generators with 534, 342, 336 and 210 thousand tonnes per year, respectively."

While the largest cattle dairy producers are "Germany, France, United Kingdom, Netherlands, Poland, Italy and Spain," who produce "32.6, 25.2, 14.9, 14, 13.2, 11.8 and 7.1 million tonnes of milk," respectively per annum. With "Spain, France, Greece and Italy," providing "970, 777, 748 and 658 thousand tonnes of sheep milk," each annually.

Based on those figures, as well as other factors, the countries that have been selected for the Life ECOFFEED project are Spain and France. Although, San Martin agrees that any of Italy, Germany, UK, Netherlands, Poland or Greece could be suitable candidates for successful implementation of the project thanks to their combination of SCG and milk production rates.

Feedinfo asked San Martin if anyone in the animal feed industry was involved in the project at this stage. He told us that the original scope of the project was tested in collaboration with an "important feed company" as well as the largest cattle farm in the Basque region, Behialde, owned and run by Erkop, who have over 1,000 head of cows producing 5 million litres of milk annually. Both parties are now involved with the full project.

The goal across the entire time period is to prove the effectiveness of the process in Spain and France before hopefully replicating the results in two other EU nations, most likely Italy and Germany.

But how do you collect two and half million tonnes of already used, wet coffee grounds, and what needs to be done to it in order for it to be suitable feed for livestock?

San Martin says that the SCGs are already collected by the HORECA industry (hotel, restaurant and catering businesses), but that changes would have to be made so that SCGs are viewed as a raw material for animal feed, and not as a waste product.

"Regarding the collection of coffee grounds, Life ECOFFEED proposes to take advantage of current logistics systems that collect other organic by-products from HORECA and are synergic with the collection of a raw material for animal feed for centralizing them in a processing plant."

Once collected "SCGs need to be stabilized to avoid the rapid degradation due to high moisture, microbial load and temperature", making them safe for livestock consumption.

And there is hope that SCG will be more than just 'safe' for livestock consumption. Preliminary studies have shown that SCGs "didn't show any negative effects on animals", San Martin told us, and that there is potential that SCGs can even increase milk yield in some cases.

He explained that with regard to dairy cows, "inclusion of 5 % SCG in the concentrate involves milk yields or fat content rates similar to the commercial diet," while when testing on dairy sheep they found that "inclusion of 10 % SCG in the concentrate involves an improvement in milk production and fat content rates against the control (commercial diet) without impairing feeding behaviour or apparent digestibility."

While previous academic studies have also shown that "increasing the cereal grains in animal feed reduces methane emissions from animals," and San Martin and his team are hoping to demonstrate whether or not SCG "might have a beneficial effect in the ruminal methanogenesis that can involve in the reduction of methane levels emission of livestock."

As far as San Martin is concerned the only real constraint for SCG as a feedstuff is tied to the source material, "Its (SCG) development as a secondary feedstuff for the animal feed industry is only a question of sustainability of the coffee sector, can it take advantage of the growing demand for alternative ingredients for livestock."

AZTI collaborates in this project with NEIKER, a public society specialized in livestock innovation; EKOGRAS, a waste management company; EUSKOVAZZA, distributor of LAVAZZA coffee products in Basque Country; RIERA NADEU, a technology provider; BEHIALDE, the largest cattle farm at project area; UAGA, member of World Rural Forum.

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