

Purifying sludge through oxygen-based digestion

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Credit: SandwichGirl

An additive for oxygen-based processing of sludge may be useful in specific cases in lowering the environmental impact of waste water treatment for the meat and dairy industries.

Dealing with sludge is one of the biggest issues of waste [water treatment](#). "Sludge accounts for about 50% of the operating costs and for 65% of the [environmental impact](#) of waste water treatment, conditioning and management," explains Jose Luis Bribián Fisac, head of sales at [waste water treatment](#) company [Bioazul](#), based in Málaga, Spain. "The company has just joined the EU co-funded [WASTERED](#) project, which

aims to optimise waste reduction in the European meat and dairy industry." These sectors are two of the highest sludge generators within the food industry.

There are different techniques to reduce the volume of so-called activated sludge— composed, among others, of microorganisms—and to stabilise it. One solution promoted by the WASTERED project involves the use of LODOred, a new and ECO-Innovative wastewater treatment additive, created by the company back in 2005. 'Lodo' is the Spanish for 'sludge', and 'red' stands for its reduction. Currently, the additive has been tested in around 50 wastewater treatments plants in Spain, Germany, Poland, Switzerland and Italy. Although it was invented for sewage sludge, the company is now trying to open up a new market in the meat and dairy industry.

What gives this additive its properties is that it is biodegradable. It can therefore be released onto activated sludge that undergoes an aerobic digestion—i.e. requiring the use of oxygen—to degrade its biological content. It works by encapsulating what are called flocs of bacteria. First, the gelatinous floc layer removes minerals and particulate from the wastewater, improving the sedimentation of the sludge.

Second, encapsulation increases the level of degradation as microorganisms' metabolism is manipulated by specially designed enzymes and vitamins. Indeed, the additive generates additional energy to supply to the microbial degradation activity. This happens because the additive pushes the equilibrium towards a process called catabolism, whereby big molecules are digested and broken down. It therefore lowers bacterial duplication and, hence, sludge production.

Some experts, such as environmental consultant Tim Evans, based in Ashted, UK, are "sceptical" of this solution. "Aerobic treatment uses lots of energy. Anaerobic systems would generate less sludge and use

less energy," he tells youris.com. Bribián Fisac is aware of this issue and explains: "We propose LODOred only for the existing aerobic plants where we can reach 30% sludge reduction," he claims.

Other experts, such as Stephen Palmer, process efficiency technical leader at the British branch of the multinational environmental engineering and [waste water](#) management firm MWH, located in Warrington, consider this solution as "credible." Yet, "the view of sludge as a valueless 'waste' is out of date," he tells youris.com. "Technologies to recover energy from sludge have become better."

However, he believes that today "an aerobic treatment is a bad design option." He adds: "an industrial waste has a very high calorific value. If it is concentrated, it might be more efficient to go for an anaerobic treatment and release biogas to produce electricity." Nevertheless, mainstream water treatment are not concentrated enough to sustain an anaerobic biomass, he believes, which makes the project solution an option in some cases.

Although the additive could prove suitable in specific circumstances, the saving in sludge processing may not be that significant. Indeed, going aerobic has an aeration cost attached. "You may have less [sludge](#) to get rid of, but having to raise dissolved oxygen in the systems, you increase operating costs," he tells youris.com "Even worse if the oxygen has to go through a jelly floc layer instead of just water." As a result, people may need to raise the [oxygen](#) injection rate to make it efficient. "The net effect is that you are not saving as much as you think".

Provided by Youris.com

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