Case Study

The technological showcase of the manure treatment system on a hog farm in Ste-Agathe de Lotbinière

An agreement was reached with a hog farmer in Ste-Agathe de Lotbinière, and the system was installed during the summer of 2019 in a building erected for this purpose. The building was built at a respectable distance from the barns (approximately 1300 feet) to avoid any risk of sanitary contamination for the animals. The official inauguration of the treatment plant took place on October 29, 2019.

Figure 1 50x60 ft building that hosts Solugen's technology

The 50x60 feet building consists in two distinct parts:

- The left section is devoted to liquid-solid separation. It also houses the tanks for treated water and ammonia nitrogen in liquid form.
- The right part is used to treat the liquid part after liquid-solid separation.

In this section, an isolated technical room hosts the automation cabinets.

Processing capacity

The system deployed for this project can process 10,000m3 of slurry per year. However, the size of the building allows the installation of a second treatment unit and thus it is possible to increase the capacity to 20,000m3.

Pig manure treatment steps

Liquid-solid separation

Figure 2 view of the liquid-solid separation room

The centrifugation unit is the main element of the separation process. The tank on the left side is used for flocculation. The centrifuge is located in the center. On the right a tank is used to store the ammonia nitrogen from the liquid mass treatment, another tank receives the treated water, and at the top is the buffer tank for the pre-treated slurry in this initial phase before it is sent to the water treatment system.

Figure 3 View of the centrifuge and conveyor in the foreground

In the background the centrifuge above the raw slurry pit and the conveyor (foreground) for transporting the solid manure outside.

Results of the analysis of the solid fraction performed by INRS (National Institute for Scientific Research)

Solid fraction (Solu-P)

Parameters	Manure 1	Manure 2
pH	7,88	n.d.
Siccity (%)	23,615	30
Ntot (g/kg)	15	18
K (g/kg)	6	5,4
Ptot (g/kg)	41,5	49

Treatment of the liquid part resulting from the separation of the liquid and solid fractions

Figure 4 General view of the evaporator

On the right side of the photograph is the evaporator with its distillation column. On the right, in the foreground, we can see the motor-compressor assemblies for vapor compression.

Process results

Figure 5 after separation: liquid manure and solid fraction

Products extracted from the liquid manure:

Clean water *Ammoniacal Nitrogen* *Bio liquid Potassium*

Figure 6: reusable clean water