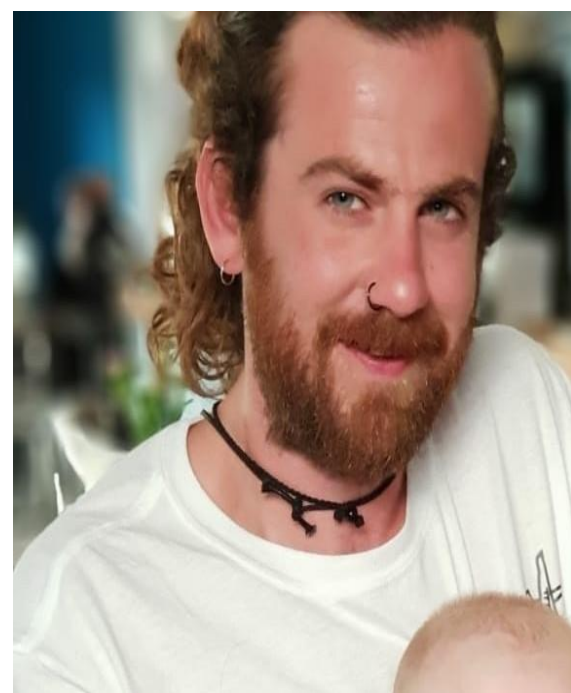




Investigation into the Sludge Produced by a Slurry dewatering Project for the Use as a Fertiliser – Containing Moisture and Nutrient Analysis

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Introduction

This project aims to investigate the product produce by the Power and Water/Coleg Sir Gar dewatering project which is currently been undertaking on a west wales farm. The existing project processes slurry from the dairy farm that houses 500 cows to produce clean water and a dry sludge or manure type product. The objective of this project is to understand the current dewatering process and operation, the current directives driving the dewatering project, the environmental impacts currently faced within agriculture and to look at the manure type product (Dried Sludge) produce by the process as the use as fertiliser.

Methods & Results

Samples of the dried sludge produced by the dewatering project showing in figure 3, were testing for moisture and nutrient content. The moisture content was asses to provide information on how the product could be further processed to produce a pellet product like 6x shown in figure 1. Nutrient Levels were analyses to provide information on the kind of nutrients available from the dried sludge and if the sludge would benefit from composting.

The results found from the sample testing can be seen in tables 1 and 2.



6x Organic fertiliser made from pelleted chicken manure. This product is similar to the product that could be produce from the dries smudges.

Figure 1 – 6x Organic Fertiliser

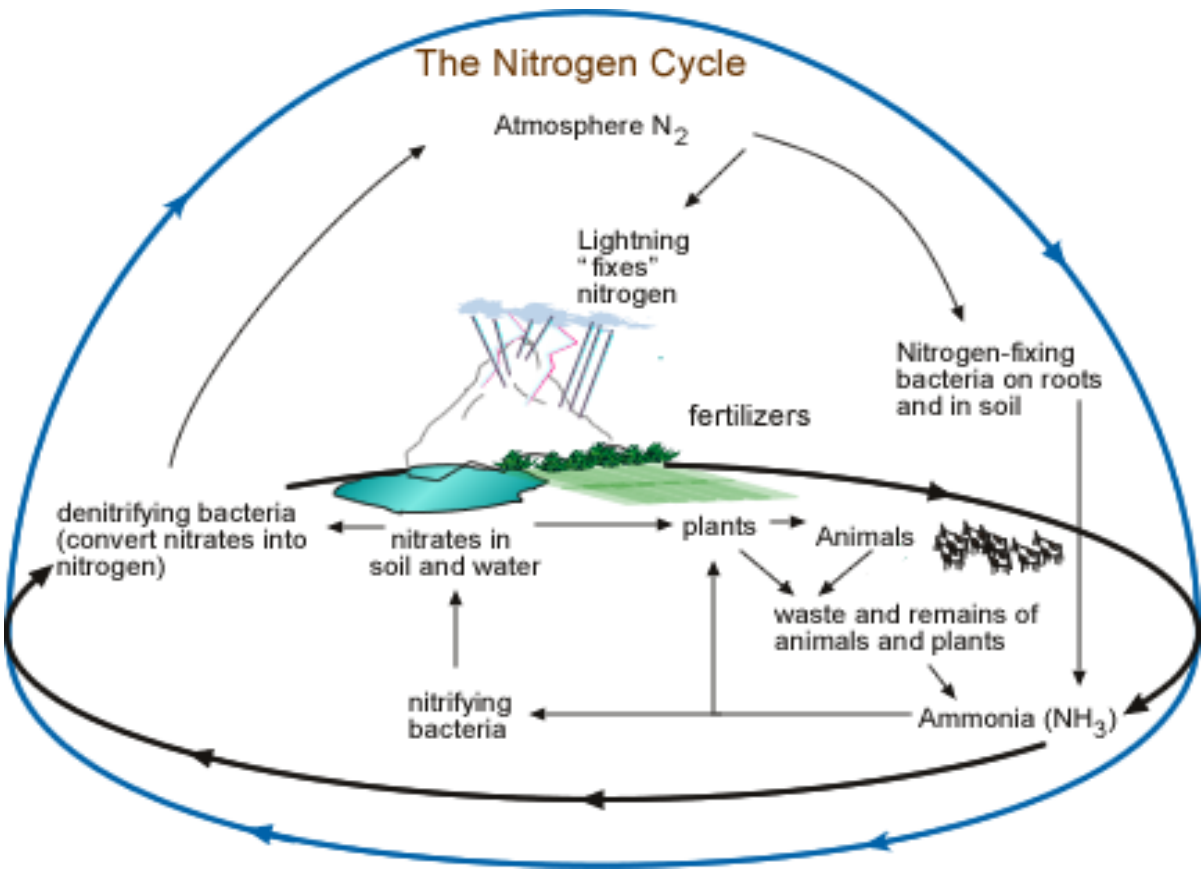


Figure 2 – Nitrogen Cycle

The nitrogen in the atmosphere is in a gas form that the plants cannot use. Therefore, eat must go through a transformation to be made available to plants s Ammonium (NH_4^+) or Nitrate (NO_3^-) which is part of the nitrogen cycle. The nitrogen cycle consists of nitrogen fixation, Ammonification, Nitrification and Denitrification (figure 3). Nitrogen in soil is usually found in the form of organic matter, therefore it needs to undergo mineralisation to be made available for plants.

Table 1 - Showing Total Solid Percentage of Dried Sludge

Screw press Total Solid %				
	Sample 1	Sample 2	Sample 3	Average
Jan 23rd	28.67	27.85		28.74
Jan 30th	26.92	25.01		26.4
Feb 6th	27.01	28.91		27.56
Feb 13th	34.55	35.66		35.01
Feb 20th	32.72	31.08		33.45
Feb 27th	28.98	29.87		27.5
			Total Average	29.77
Centrifuge Total Solids %				
	Sample 1	Sample 2	Sample 3	Average
Jan 23rd	23.4	22.97		23.55
Jan 30th	20.26	21.88		21.05
Feb 6th	23.44	22.98		23.6
Feb 13th	22.38	22.04		21.65
Feb 20th	31.78	30.78		32.15
Feb 27th	25.88	26.43		25.01
			Total Average	24.51

Table 2 Showing Nutrient Levels of Both Dried Sludges

Nitrogen Test		
Week	Centrifuge	Screw Press
1	Low to Medium	Medium
2	Medium	Medium to High
3	Low to Medium	Medium
4	Medium	Low to Medium
Phosphorous		
Week	Centrifuge	Screw Press
1	Low	Low
2	Low	Low
3	Low	Low
4	Low	Low
Potassium		
Week	Centrifuge	Screw Press
1	High	Med
2	High	Med
3	Med	High
4	High	Med

Acknowledgements

Neil Nicholas – Coleg Sir Gar Dewatering plant Engineer

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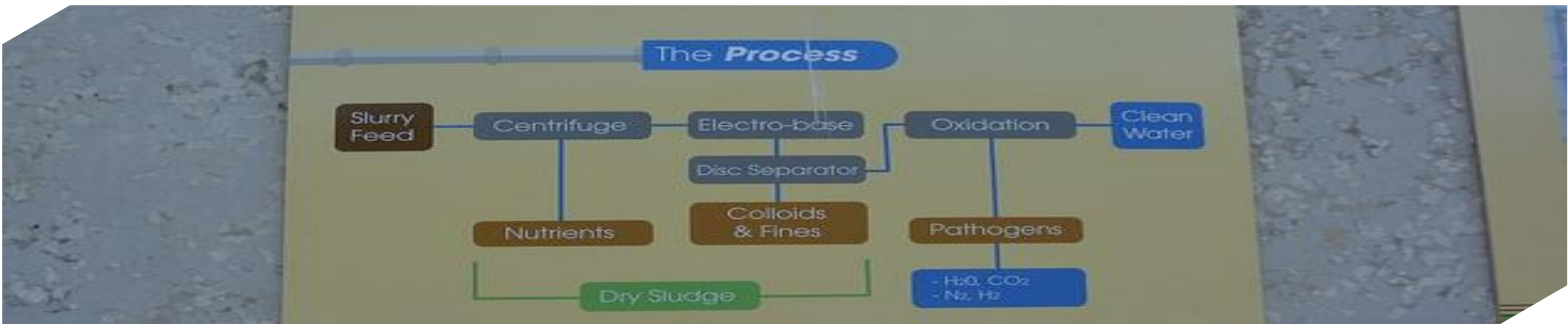


Figure 3 – The Dewatering Process