

# AL<sup>-2</sup>

# Nutrient-solid separation



AL-2 unit 3,6x2 -128 gal/min throughput

## The AL-2 machine, your best investment ever!

- 35 – 50 % removal on total nitrogen.
- > 90 % removal of the organic nitrogen.
- 40 – 99 % removal of phosphorus (adjustable).
- Effluent as made for used in irrigation.
- No more cleaning lagoons.
- Solids with an excellent fertilizer value.
- Development through 20 years has made the process and the technology extremely robust and reliable.

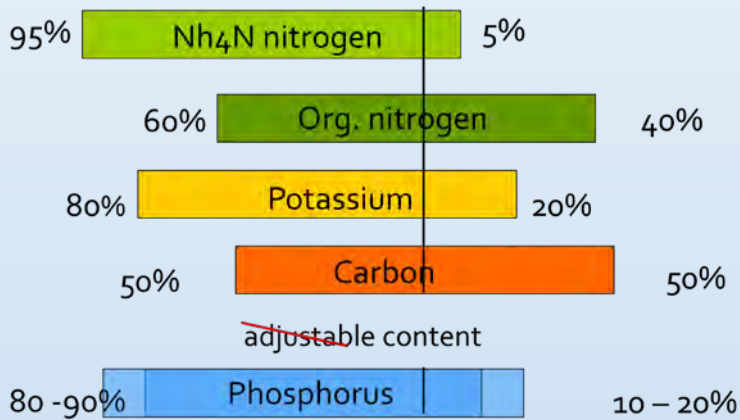


# The AL-2 System - like no other

The AL-2 nutrient-solid separation system is not like other separation systems, with this system you can actually excrete phosphorus and nitrogen, let's compare how the nutrients by separation is distributed percentage in the reject water and fiber

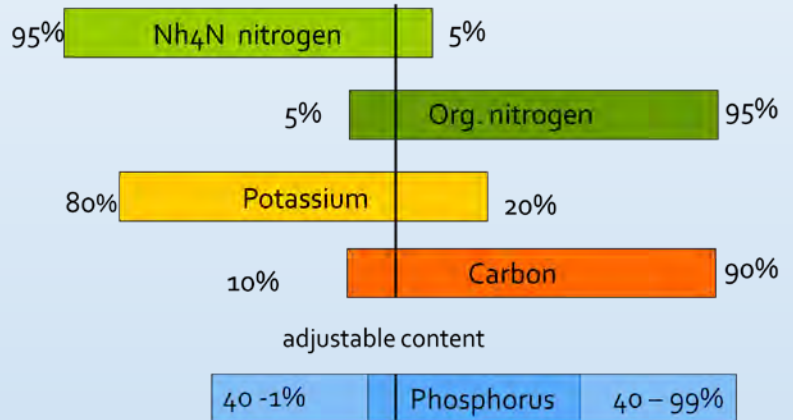
## Separation with screwpress

**Reject water      Fiber fraction**



## Separation with AL-2 system

**Reject water      Fiber fraction**



### Example: Separation of digested slurry from a dairy production

Digested Biomass	% Dry matter	Total Nitrogen mg/kg	% of total nitrogen	Total Phosphorus mg/kg	% of total Phosphorus
Separation Influent	4,7	2.220	100	221	100
AL-2 Separation Reject water	1,2	1.500	59	47	21
AL-2 Separation Fiber fraction	27,5	5.200	41	1.130	79

### Coagulants and polymer helps

With help from coagulants and polymer, the small organic particles and phosphorous get "tied up". Hereby excretes large amounts of nutrients in the fibre, that makes the AL-2 system to the most effective on the market.

Different coagulants and polymers produces different results. With lab. tests the desired result of the separation is found.

### Design your own liquids.

You can extract all organic substance from the slurry and up to 99% of phosphorus, which means that you have a liquid that is very easy to ejected in the fields and your lagoons are not filled up with fiber, which is very expensive to get emptied,

### Nutrients rich solids

More than 90% of the organic nitrogen and phosphorus will accumulate in the fibre. This makes the fibre have a high value as organic fertilizer.

Fiber from pigmanure is used for compost, biogas or gasification The fiber contains all phosphorus and organic matter from the slurry.



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## Separation of pig manure, use the fiber for biogas, gasification or compost.

By separating pig slurry with the AL-2 system is all the organic carbon, phosphorus and organic nitrogen excreted in the fiber fraction which occupies only 10% of the original amount, that way you get a high-value product to use in biogas or for gasification.

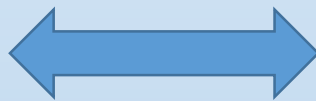
The outlet of this biogas plant is also a valuable concentrated fertilizer product to the fields with a high contents of nitrogen and phosphorus.

By a pork production with 132,000 gal manure per day appear here distinction between no separation and separated by the AL-2 system



24 Trucks of manure

- 132.000 gpd.
- 8240 cu yd. Methane.
- 60.000 lbs org. Carbon.
- 5.500 lbs tot. Nitrogen.
- 3.800 lbs Ammonium.
- 5.300 lbs Phosphorus.

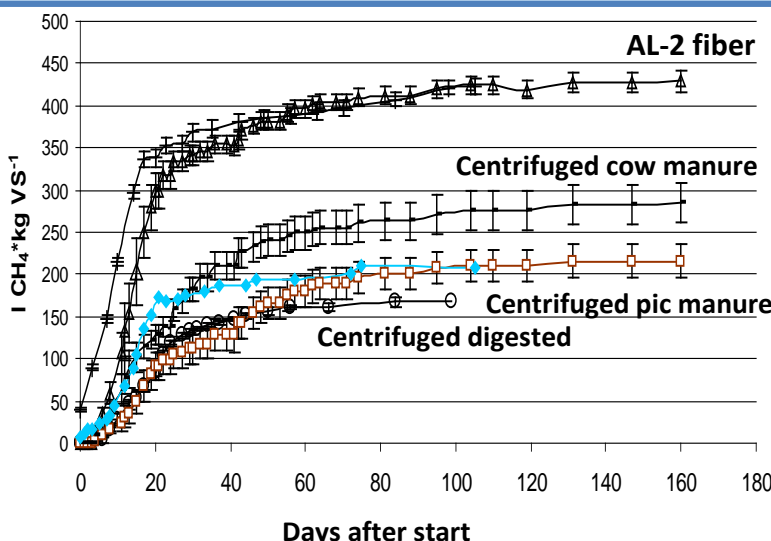


4 load of Separated fiber

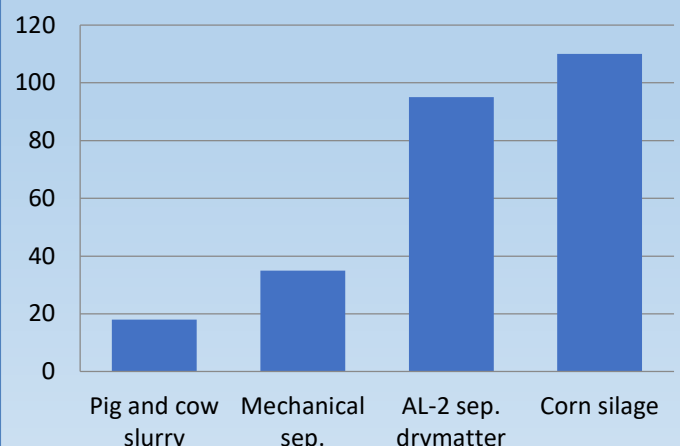
- 13.200 gpd.
- 8.000 cu yd. Methane.
- 46.300 lbs org. Carbon.
- 2050 lbs tot. Nitrogen.
- 398 lbs Ammonium.
- 5070 lbs Phosphorus.

## Biogas Yield by various separation techniques

As clearly seen below there is obtained a much higher methane yield of fiber made with an AL-2 system. This is due the very efficient separation, where all organic matters in the slurry is separated into the fiber.



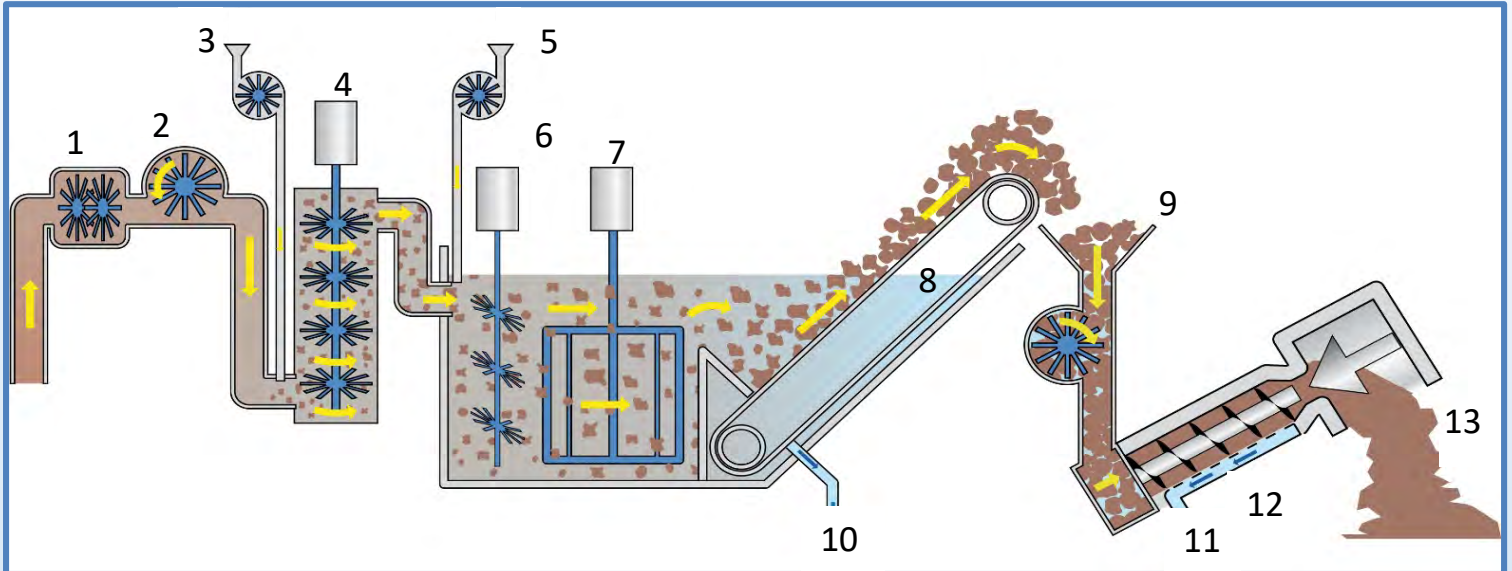
### Methane m<sup>3</sup> per ton mass







# The working principle of the AL-2 system



1: Chopper, 2: Feedpump, 3: adding coagulant, 4: mixing, 5: adding polymer, 6: mixing, 7: flocculation, 8: drainage, 9: fiber 12 % DM. 10: reject water, 11: reject water, 12: Screw press, 13: Fiber 25 - 30 % DM



Biomass is introduced to the machine by variable drive pump, and flowmeter for control and documentation.



coagulants and polymer are added to the biomass stream with a very accurate mixing.



64 gal./min plant installed in a 40 ft. container, delivered as "plug and play" a minimum amount of on-site construction is required.



Gentle process is used by gravity to separate water from solids.

Container unit with fiber transport system as "plug and play" a minimum amount of on-site construction is required.

3 model sizes in overview.

Model	Throughput gal/min	Footprint W x L x H ft	Installation options*	Power required	Min. moisture content in fiber
3,6 D	32	2,5x16x5,5	M - P&P - B	16 Amps.	80 %
3,6 M	64	5 x 21 x 5,5	M - P&P - B	25 Amps.	65 %
3,6 Mx2	128	11x 21 x5,5	B	32 Amps.	65 %

\* Installation options: M = Mobil, P&P = plug & play delivered in container, B = Building required.



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