

Decanter centrifuges are ahead of manure management curve

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Management of manure is growing in importance for dairymen given a variety of issues that range from the inherent desire to protect the environment to the need to ensure profitability.

It's why more and more dairymen are taking a page from industries outside of the farm and looking to decanter centrifuges for more effective separation of manure solids. By using decanter centrifuges instead of conventional manure solids separation equipment, progressive-minded dairymen are coming out ahead in efficient separation, meeting regulations and profitability.

Here are the issues driving the need for a better solution for the separation of manure solids and the value decanter centrifuges deliver.

Issues drive need for change

Efforts to effectively manage manure on dairy farms have been in place for more than 100 years, but there are a variety of reasons why the topic has risen to the forefront.

One reason is that dairymen are asked to economically produce milk for the world – even at low milk prices – while minimizing the impact of their farms on the environment. Meanwhile, regulators are increasingly looking to dairymen and others in the agricultural sector to address water quality and phosphorus emissions rather than putting the burden on wastewater treatment plants.

All that, in addition to the ongoing need to improve the bottom line through operational

efficiencies, including more effective and cost-efficient ways to separate solids in manure slurry.

In light of the issues, dairymen have begun to incorporate decanter centrifuges into their manure management processes based on the advantages they deliver to separate manure solids.

Ideally suited for dairymen

A decanter centrifuge is a self-contained machine that uses high rotational speed (centrifugal force) to separate solids and liquids, making it an essential component of wastewater treatment plants and facilities in a host of other industries. The technology is also proving to be ideal for dairy farms.

Decanter centrifuges are used for solid-liquid separation of manure and wastewater that originates from washing areas and the process of flushing of cow alleys. Here's how a decanter centrifuge functions in a typical dairy operation:

- ◆ Manure slurry is fed into intake point of the centrifuge.
- ◆ High-speed rotation separates solids from liquids in seconds. Heavy solids are forced to the outermost bowl of the unit.
- ◆ A scroll conveys the solids through the machine where they are discharged through a designated outlet.
- ◆ Liquid is discharged through a separate outlet.

Every dairy operation has a different configuration. However, a decanter centrifuge can be readily incorporated into



Dairymen have begun to incorporate decanter centrifuges into their manure management processes based on the advantages they deliver to separate manure solids. Photo provided by Josh Gable.

individual manure processes – whether after manure removal from the barn, in conjunction with the sand separator or following anaerobic digestion. When necessary, polymers or coagulants can be added to the process to enhance solids and nutrient recovery.

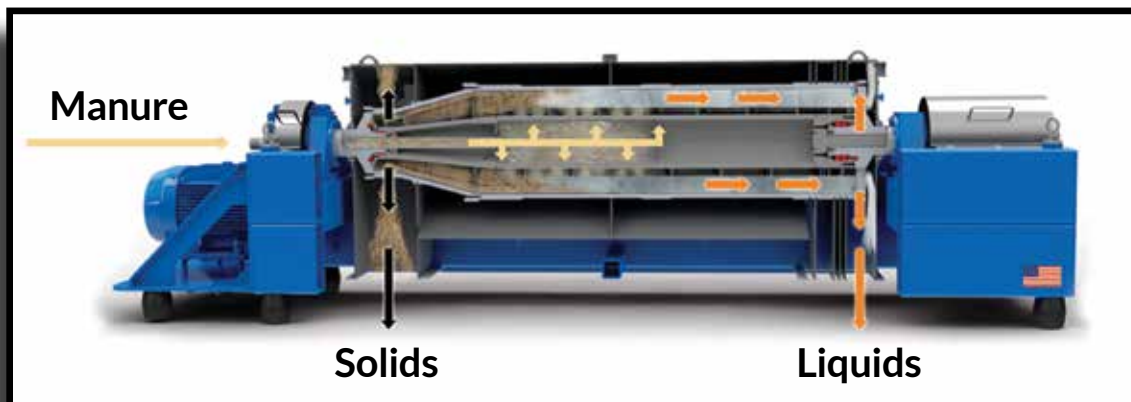
The incorporation of a decanter centrifuge into any farm is driven by the characteristics of the operation since existing processes for manure management vary, as does the feed composition. Additionally, each setup must be optimized to produce the best results based on established goals. Care also needs to be taken when vetting options since not all decanter

centrifuges are alike.

A cut (and more) above conventional equipment

By incorporating a decanter centrifuge into its manure management processes, a dairy can meet the challenges and issues of manure and nutrient management head on.

The advantages of a decanter centrifuge have to do in large part with the efficiency of solids separation. When compared to traditional separation equipment, multiple studies at dairy farms have shown that an optimized decanter centrifuge captures more total solids. In field studies, the decanter centrifuge demonstrated


Figure 1


the ability to separate out considerably more solids when compared with conventional equipment – without the addition of coagulants and polymers. Use of such additives, however, also demonstrated the ability to further increase the level of solids and nutrients that can be separated.

A key aspect of a decanter centrifuge is that it is able to capture and separate finer particles from liquid manure versus traditional equipment. As such, it removes much more phosphorus from liquid manure when compared with traditional equipment. The same field studies, for example, showed significantly more phosphorus removal without chemical additions and an even higher percentage of removal with chemical additions. The reason is because phosphorus tends to bind to the finest particles.

Another advantage a decanter centrifuge delivers is low owning and operating costs. For one, the unit requires minimal day-to-

day maintenance and cleaning when compared with screw presses, screens and the like. In the vast majority of cases, a single centrifuge can operate as a complete solids removal system, reducing the number of separate pieces of equipment needed.

Decanter centrifuges built specifically for busy dairymen are also designed for ease of use. Each decanter centrifuge is initially optimized around the processes and goals of each individual farm. The unit then runs continuously when required without the need for a full-time operator.

Economic advantages add up

The ability of decanter centrifuges to more efficiently separate manure solids allows dairymen to work smarter and meet their specific goals – while also helping to increase the profitability of the farm in numerous ways:

- ◆ *Bedding savings and revenue:* A higher percentage of solids recovery eliminates the need

for purchasing and hauling in bedding material. In some cases, farmers can also make an extra profit by selling the excess solids as bedding material to other farms.

- ◆ *Lower lagoon management costs:* More solids removal means less of it finds its way into the lagoon, sometimes saving tens of thousands of dollars annually on dredging and hauling costs, depending on the operation.

- ◆ *Land application and storage benefits:* Since more phosphorus is removed from the liquid manure, more of it can be applied to given parcels of land. The ability to apply more manure on specific areas of land thus enables larger herds for a given piece of land. The process also results in ease of storage given the differences involved in storing a lower volume of solids versus a consistent volume of liquid. Solids can also be applied on demand.

- ◆ *Value-added solids:* Since the

solids contain higher levels of phosphorus in combination with other beneficial nutrients, it serves as a valuable fertilizer that can be stored and applied when fields are open and crops need the extra boost in phosphorus. In some cases, the solids can be further stabilized through a composting or pelletizing process and sold commercially.

- ◆ *Fertilizer savings:* Whether it's liquid or solid manure, every pound can be used beneficially to save costs when compared to the expense of conventional fertilizer given storage and application costs. In addition, because the coarse solids and much of the finer solids are removed, center pivots can be used to distribute liquid manure where local regulations and odor constraints allow.

- ◆ *Water savings:* Centrifuged manure with a low solid content can be recycled and used to wash sand bedding or flush barns, saving costs to acquire and treat water for the same purpose. The water savings are particularly important in areas where water shortages are a critical concern.

Getting ahead of the curve

Perhaps more than any other industry, success for dairymen dictates the need to constantly adapt to change. Fortunately, the use of a decanter centrifuge optimized specifically for each individual dairy operation is a change that puts dairymen ahead of the curve when it comes to cost-effectively managing manure – allowing them to focus on the business of producing milk. **PD**

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