

# DIGESTER TYPE PERFORMANCE COMPARISON

DAIRY MANURE (ONLY) EXAMPLE



	COVERED LAGOON	COMPLETE MIX	LINEAR VORTEX™	COMMENTS
Design generation	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	Assumes all designs are periodically updated
Plant longevity (average), years	5-10	15	20 - 30	Steel tanks & flexible membranes degrade faster than concrete
Design shorthand	Plug-Flow	Mixed / CSTR	Mixed Plug-Flow	DVO's 2- Stage MPF combines the best aspects from older generation designs
<b>Biogas output</b> "per milking cow" (avg), ft <sup>3</sup> /day	<b>50</b>	<b>80</b>	<b>115</b>	DVO's system produces 105-130 ft <sup>3</sup> "per cow," +2 times "covered lagoon" AD
Processes <b>100%</b> of the dairy manure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Covered lagoon systems <b>MUST</b> bypass dairy solids (this is not a "feature")
Performance is <b>not "seasonal"</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Covered lagoon performance varies widely & is dependent upon the weather
<b>Lowest cost</b> per installed kW	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	A key indicator reflecting a positive "Return on Investment"
<b>Flush, Scrape &amp; Vac</b> -collection dairies served	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Every modern dairy design is represented by DVO farmers
Processes <b>more dairy waste</b> than any other	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DVO is (by far) the largest biogas company in North America
Animal <b>bedding</b> quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Greatly influences herd health and milk quality
<b>NO composting</b> of solids is needed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Bypassed solids from Covered Lagoons must be separately composted
<b>Pathogen</b> destruction (e-coli, salmonella etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Harmful bacteria that causes mastitis and other problems for cattle, and humans
<b>Odor</b> and <b>weed-seed</b> destruction	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Complete digestion = more effective odor, vector & weed seed control
<b>Methane emissions avoided</b> "per cow"	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DVO avoids the CH <sub>4</sub> from solids composting, & unspent liquid that bypass AD
<b>GHG impacts</b> overall avoided	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Composting emits some CH <sub>4</sub> , and also creates N <sub>2</sub> O (310x worse than CO <sub>2</sub> !)
<b>Renewable power generated</b> "per cow"	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	More biogas "per-cow" = more power generated "per cow" too
Positive <b>carbon footprint</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Higher operating efficiency/kW generated, longevity & thorough digestion
Digester is certified " <b>Newtrient Recognized</b> "	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	By independent dairy organization "Newtrient, LLC"
Optional " <b>Ammonia Recovery</b> " step	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	"AR" is a proven method to greatly reduce ammonia emissions from lagoons
Optional <b>Phosphorus Recovery</b> " step	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	"PR" offers a proven method to remove 80-95% of Phos from manure slurries
Suitable for <b>Co-generation</b> (i.e. food wastes)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Active mixing is required for most offsite organics