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**Comparison of the ATD Manure Treatment System
to Anaerobic Digesters and Composting**

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ATD System	Anaerobic Digesters	Composting
Manure Flow: Barn to Plant to Pellet storage with liquids recycled to Barn.	Barn to Digester to Lagoon to land unless full treatment systems are added to separate and dry solids for pellets and treat water for recycling.	Barn to separator with liquids to lagoon and land and solids to mixer for addition of carbon and structure then to land.
Process Time: 1 day	Must be designed for digester residence time of many days, additional treatment would be sized accordingly for 1 day. Otherwise lagoons with annual pumpout	Solids will take 45 to 60 days depending on management and weather.
Water Consumption: 3.7 Litres /day/place	22.1 Litres /day/place (Assuming 2.7% solids in pumpout) or for 10,000 places, 150,000 Litres /day	22.1 Litres /day/place. (Assuming 2.7% solids in pumpout) or for 10,000 places, 150,000 Litres /day
Odours: Off floor evaporation only remaining source. Eliminates Hydrogen Sulfide and Ammonia.	Somewhat reduced	Somewhat reduced if managed intensively.
Greenhouse Gases: Reduced by over 65%	Methane burning reduces greenhouse gas release.	Active management can reduce ammonia release from solids

<p>Disposal Acreage: As surplus pellets can be sold off-site the opportunity for re-balancing nutrients to available land can be achieved with the least disruption. As regulators focus on these issues, the ability to export any surplus will allow new choices to be made. It is now possible to expand to obtain economies of scale on the same land base.</p>	<p>Unless additional treatment is installed the equations remain the same.</p>	<p>No change.</p>
<p>Nutrient Management: N losses as high as 70% can be eliminated. Phosphorus is all in the pellet. Surplus nutrients can be sold off-site as a dry, pathogen free pellet with consistent analysis.</p>	<p>Methane burning in itself has no effect on N,P,K. Inconsistent and lower nutrient levels continue with lagoon pumpouts. Surplus nutrients will still require additional treatment.</p>	<p>The more volatile nutrients are stabilized in the solids and the liquids retain dissolved nutrients as before.</p>
<p>Products for Sale: Surplus nutrients in pellets Greenhouse gas reductions</p>	<p>Electricity Greenhouse gas reductions</p>	<p>Surplus compost</p>
<p>Pathogens and weed seeds: Both liquids and solids are pathogen free and weed seeds are infertile.</p>	<p>No change unless additional treatment is added</p>	<p>Liquids are untreated and a well managed compost with sufficient heat will kill the weed seeds.</p>

<p>Site Requirements: A building 100' by 50' located somewhere along the present route to the lagoon would allow new plumbing arrangements to be made conveniently. Three phase power and reliable telecommunications will be needed. This is a chemical/mechanical process having no biological treatment component affected by weather. It is computer assisted and remotely monitored to ensure trouble free operation. Certificates are not required by staff for operation.</p>	<p>The digester should be located between the barns and the existing lagoon if possible. Connections will be needed to the power grid. Heat losses over the winter months are a consideration. If additional processing is added to close the loop on water quality and dried pellets then the site should be large enough to take these additions at some point.</p>	<p>The compost piles may need cover and will need sufficient room for 60 days retention. A pad may be required for leachate control.</p>
<p>Bottom Line: The effect on costs will be the difference between current expenditures and new system expenditures. ATD offers to review these with potential clients to determine the benefits before commitments are made. See our estimates for an 11,000 place grow to finish conversion in SE Manitoba. Expansion to 20,000 places on same land base provides economies of scale and potential profit of \$4.00 per market hog.</p>	<p>It would appear that the costs of the digester and generating equipment less the power savings, power sales and heat consumption must be isolated as a separate issue. The issues of the lagoons, odour and nutrient balance remain until additional treatments are added.</p>	<p>Compost holds more water than pellets and thus adds to hauling costs when exported. The nutrient levels may not be consistent and the market for the product may be elusive.</p>

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