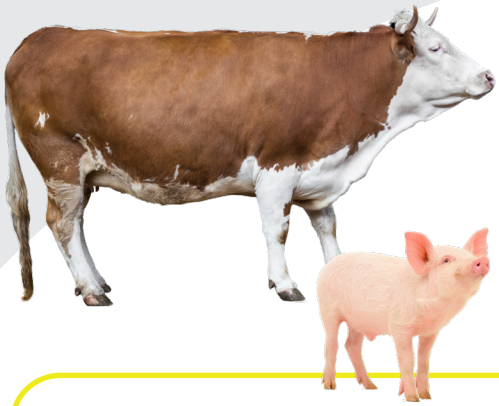
SHAC® Manure Digester

APPLICATION GUIDE



Decreases ammonia gas and odors, and aids manure management in livestock production operations.

SHAC *Manure Digester*™ (MD) stimulates resident microbes present in manure to enhance the decomposition of organic material.

- Decreases harmful ammonia gas and offensive odors for a safer, healthier, more pleasant environment for workers and livestock.
- Loosens, liquefies, and reduces organic solids for easier pumping.
- Aids in removing and preventing crusts for easier manure management.
- Reduces overall volume to minimize hauling frequency, pumping and spreading - save time and money.

SHAC *MANURE DIGESTER*™ IS DESIGNED FOR THE FOLLOWING MANURE SYSTEMS:

- shallow and deep pit systems
- slurry stores and lagoons
- straw packs / dry mounds and bio-shelters
- solid separation systems
- shallow gutters with scrapers
- open fields and pens
- compost enclosures

For more information on Shac *Manure Digester* ™ scan QR Code

Application Rates:

NOTE: These rates are to be used as a guideline only. Conditions in every barn, pit or lagoon will be variable depending on system design, rations, climate, local water quality, chemical use and the volume of manure present. It may be necessary to adjust application rates accordingly (depending on individual site conditions). For more information, please visit our website at www.shac.ca or contact us Toll Free in North America at 1-888-533-4446

Lagoon and Slurry Store Rates:

	Rate	Where to apply
Initial treatment	40 L MD per 375,000 L manure (10 US gal MD per 100,000 US gal manure)	Directly to the lagoon or slurry store beneath the crust in 2-3 locations.
Maintenance Treatments	20 L MD per 375,000 L manure (5 US gal MD per 100,000 US gal manure)	Directly through the barn flush or drainage system.

LAGOON MAINTENANCE TREATMENTS ARE NOT NECESSARY IF BARNS ARE TREATED ON A PER HEAD BASIS *(SEE NEXT PAGE)

Weaners & Finishers:

Number of hogs	First time MD Treatment (L)	Monthly MD rate (L)
100	2	1
200	4	2
300	6	3
400	8	4
500	10	5
600	12	6
700	14	7
800	16	8
900	18	9
1000	20	10

Sows:

Number of hogs	First time MD Treatment (L)	Monthly MD rate (L)
50	2	1
100	4	2
200	8	4
300	12	6
400	14	7.5
500	18	9
600	22	11
700	26	13
800	30	15
900	33	16.5
1000	36	18

These rates are listed on a per month basis, as this is the optimal frequency to apply product to the pits. However, for convenience, the product required for an entire retention period may be applied all at once, and should be applied early in the storage period.

Example: A producer has 300 weaner hogs in a barn with a pit that has a retention time of 6 months, and wants to use *Manure Digester* (MD) for the first time. How much *Manure Digester*™ should the producer use and how should it be applied?

Option #1: The producer may apply 6 litres MD (first time treatment dose) the first month, and 3 litres MD for the next 5 months (resulting in a total of 21 L MD) until the pit is emptied.

Option #2: The producer may apply the whole 21 L MD in the first month. Other options include splitting this amount in half, such as applying 10.5 L in the first month, and 10.5 in month 3, or into thirds and applying 7 L every two months.

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Dairy / Beef Manure Management Systems Application Rates:

Application	Rate	Where to apply
Barn Cleaning Systems	Mix 1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water).	• Pour into the scraper pit or along barn gutters to achieve achieve maximum mixing.
Composting Manure Bedding Piles: Before Piling	Mix 1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water) for every 75 cubic meters (100 cubic yards) of manure.	• Spray onto manure.
Composting Manure and Bedding Piles: After Piling	Mix 1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water) for every 75 cubic meters (100 cubic yards) of manure.	• Spray onto surface of pile and/or inject into pile with spray wands and probes.

*** Adding the treatment after piling will reduce effectiveness**

Poultry Manure Management Systems Application Rates:

Application	Rate	Where to apply
Dry Pits	Initial: 1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water) per 1000 birds per week for the first four weeks of treatment. Maintenance: 1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water) per 2000 birds per week.	• Apply at multiple pit locations where you will get best distribution of treatment.
Litter Packs	1 litre MD in 20 litres of water (1 US qt. MD per 5 US gal water) per 150 birds per turn.	• Spray litter after it is spread before the birds enter. • Follow the same procedure for each turn in deep litter packs. • As required, spray areas around water or feed dispensers, as these areas receive the greatest moisture and compaction.

Compost System Application Rates:

Type of Treatment	Rate	Where to apply
Initial	Mix 250 ml (8 oz) MD in 1.25 litres (42 oz) of water (1 to 5 ratio) per 40 gal (5 cubic ft.) of compost material.	• Pour directly onto compost pile ensuring even coverage.
Maintenance	Use a rate of 1 part MD to 5 parts water.	• Re-apply when new compost material is added to the pile. • Apply enough mixture to moisten surface of fresh material.

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Troubleshooting for Manure Management Applications:

Problem	Possible Cause	Solution
Odor is still present	• Overflow at top of multi- stage lagoon.	• Lower pipe: liquid should be drawn from intake pipe located in the facultative zone (approx. 1/2 of the pit depth).
Not a lot of percolation and / or bubbling in pit	• Extreme temperatures present: less than 10°C /50°F or greater than 71°C /160°F for a manure or compost pile.	• Too cold: delay treatment until warmer season. • Too hot: may slow/kill some microbes - turn or open pile.
	• Presence of chemicals (antibiotics, bleach, copper sulfate, etc).	• Clean out present material in pit / lagoon or dilute material. • Cease adding chemicals to lagoon; dispose elsewhere.
	• High salt levels in water and feed ration (check combined value).	• Seek out alternative water sources or decrease the amount of salt in the feed.
	• Ensure that all manure is treated.	• Treat & account for all new manure addition to pit/lagoon.
Crust conditions persist for more than 2 weeks and/or pit conditions not improving	• Manure and/or crust too dry (pit fans drying it out, lagoon pumping for irrigation removing too much moisture.	• Direct fans elsewhere or slow them down. • Add water to pit to ensure at least 30% moisture in pit at all times. • With extensive irrigation, it may be necessary to add more product & water to make up what has been removed. • Persistent crust: try agitating crust surface before pumping and/or: • Spray crust with water and SHAC MD at a rate of: 1L MD / 375 L of water (1 US qt / 100 US gal).
	• Harmful substances leaching from new curing concrete (new pit) cause pit to stop working - microbes are harmed by chemicals.	• Treatment is not recommended until pit has been filled to capacity and emptied once. • If treatment is necessary, fill pit with 6" water first and double the rate of MD recommended for that volume.
Sow barn conditions not improving and/or persistent solid masses present	• High fiber sow diets make manure drier and more dense.	• Best results: in several locations furthest from pull plug, inject water into the solid mass where it is thick until it moves or water comes to surface. • If water rises immediately & mass doesn't move, plug drains & fill pit with as much fresh water as possible and apply another treatment of MD.
Stubborn build up	• Corners are dry and/or heavy solids.	• Probe holes into solids as deep as possible & pour MD and water directly into holes. Note: consistent treatment and adequate agitation of entire pit should help to prevent this in the future.

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HELPFUL HINTS FOR SUCCESSFUL COMPOSTING:

- Try to achieve a 50/50 balance of "green" material (i.e. high nitrogen material such as grass clippings, vegetable peelings, manure) and "brown" material (i.e. high carbon material such as dried leaves and grass clippings, straw).
- A shovel full of soil in the bottom of the composter will supply helpful microorganisms for composting.
- Moisture is vital! Compost material should be kept **moist** but not too wet. When you squeeze a handful of compost pile material, it should be spongy but not dripping.

Troubleshooting for Composting ...

Symptom	Problem	Solution
The compost has a bad odor.	• Not enough air.	• Turn (mix) the pile.
The compost smells like ammonia.	• Too wet. • Ammonia smell - usually means too much fresh green material. • Material is too compact.	• Add fresh dry material and turn to mix thoroughly. • Add more brown dry material and mix pile thoroughly. • Loosen the compost and add moisture while turning.
The pile center is dry or white mold is present.	• Not enough water.	• Moisten pile with water and SHAC MD and turn it.
The pile is sweet smelling but will not heat up.	• Lack of nitrogen in pile.	• Mix in nitrogen source (green material).
The pile is damp in the middle, but dry everywhere else.	• Pile is too small or too dry.	• Collect more material (both green and brown); moisten with SHAC MD and water.
Rodents / Vermin in pile.	• Meat or fatty food scraps added to pile attract rodents and vermin.	• Cover each addition of food scraps with a layer of compost and place bin on a fine wire mesh.
High pile temperature (+140°F / 60°C).	• Pile too large. • Insufficient ventilation.	• Reduce pile size. • Turn pile.
Cold weather.	• Slows pile activity; potential cooling/freezing of pile.	• Increase pile size and/or insulate with straw.
Pile will not heat up.	• Needs more air.	• Turn pile.

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