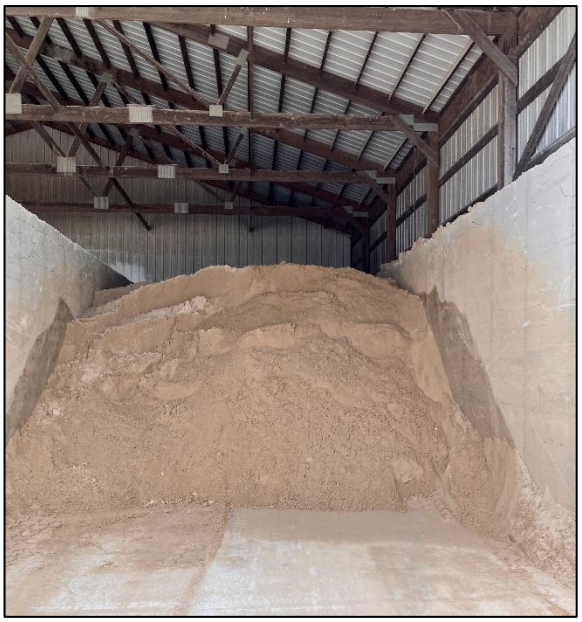
WVS MILK QUALITY

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The Foundation of Milk Quality:
Why Testing Virgin Sand is Non-Negotiable for Dairy Freestall Barns

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We recently had several herds that had stubborn SCC's that didn't want to come down after the summer heat. They had been getting their sand from where they had always been getting it. We finally got around to testing it and found out it had become a lot wetter. It probably wasn't the only culprit, but it was contributing to the elevated SCC. After that I decided that we really need to do routine testing of sand. The cost is less than $60 and is cheap compared to what we could have saved.



While sand is widely considered the gold standard for bedding, be sure to test fresh stand prior to using it in the freestall barn. Pictured on the left is a new pile of sand.

Testing virgin sand before it enters a dairy freestall barn is the single most critical step in safeguarding cow comfort, hoof health, and milk quality. While sand is widely considered the gold standard for dairy bedding due to its inorganic nature and excellent drainage, not all sand is created equal. Assuming that "virgin" sand fresh from a pit is clean and ready for the barn can be a costly mistake.

To prevent catastrophic spikes in mastitis and structural bedding failures, producers must rigorously evaluate sand based on three core metrics: dry matter, organic matter, and bacterial counts.

1. Dry Matter: The Shield Against Bacterial Growth

Dry matter (DM) measures the moisture content of the sand. For optimal freestall performance, virgin sand should ideally have a dry matter content of 95% or higher (meaning less than 5% moisture).

- **The Risk of Wet Sand:** Sand coming out of a wet pit or stored uncovered retains significant moisture. Moisture is the lifeblood of pathogens; high-moisture sand creates a humid microclimate right beneath the cow's udder, accelerating the explosion of environmental bacteria.
- **The Bedding Effect:** Wet sand packs tightly, losing its fluffy, cushioning properties. It clings to the cows' coats and teats, making pre-milking prep difficult and increasing the risk of teat-end contamination.

2. Organic Matter: Starving the Pathogens

By definition, pure sand is inorganic. However, virgin sand pits are frequently contaminated with topsoil, clay, roots, or agricultural runoff. Testing ensures that the organic matter (OM) content remains strictly below 1% to 2%.

- **The Fuel for Bacteria:** Environmental mastitis-causing pathogens—such as Klebsiella, E. coli, and Streptococcus uberis—cannot multiply on pure, inorganic sand because it lacks a food source.
- **The Contamination Multiplier:** If virgin sand contains high levels of organic matter, you are effectively introducing a built-in food source

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for bacteria before the cow even steps into the stall. When combined with stall moisture and body heat, high-OM sand becomes an incubator for disease.

3. Bacterial Counts: Establishing a Clean Baseline

It is a common myth that virgin sand is sterile. Pit sand can easily be contaminated by wildlife, standard bird droppings, or contaminated surface water runoff. Testing for coliforms, Klebsiella, and environmental Streptococci establishes a critical baseline.

- **Preventing the "Trojan Horse" Effect:** Introducing sand that already boasts high bacterial counts undermines your entire herd health strategy. The baseline bacterial count of your bedding pile should be as close to zero as possible.
- **Proactive Biosecurity:** Knowing the bacterial load of your virgin source allows you to reject a contaminated load or adjust your stall management protocols before an outbreak of clinical mastitis takes hold in your cows.

The Economic Payoff of Pre-Testing

Skipping a simple laboratory sand analysis can result in severe financial penalties, including:

- **Elevated Somatic Cell Counts (SCC),** which slash quality premiums.
- **Increased treatment costs** and discarded milk from clinical mastitis cases.
- **Premature culling** due to severe, unresponsive environmental infections.

Final Takeaway

Don't let the term "virgin sand" give you a false sense of security. Before dumping a single load into your freestall barns, send a composite sample to our laboratory. The cost is less than $60.00 and can easily save you thousands. Every time a new pit is being used the sand should be tested. It is also a good idea to routinely test your sand because things can change. Prioritizing dry matter, minimizing organic matter, and verifying low bacterial counts ensures your sand remains an asset to your dairy, rather than a liability.

How to Properly Sample a New Sand Delivery

Taking a sample from a single spot on a pile can lead to highly inaccurate lab results. For an accurate assessment, implement this standard sampling protocol:

1. Avoid the Crust: Do not shovel sand directly off the surface of a delivered pile. The outer layer is often altered by wind, immediate sun exposure, or recent rain.
2. Dig In: Dig approximately 1 to 2 feet into the pile at 4 or 5 different locations around the stack.
3. Composite and Mix: Collect a handful from each dug location, place them into a clean container or gallon bag, and mix thoroughly.
4. For Bacteriological / Mastitis Culture (CFU Testing).

Short-term (under 24 hours): Place the sand samples in a sealed freezer bag and keep them in a **cooler with ice or ice packs** during transport.

Longer-term (over 24 hours): Freeze the samples immediately. The bedding lab explicitly instructs producers to freeze bedding samples overnight or until they are ready to ship via overnight mail on ice.

Target Goals for Bedding

Dry Matter	95-96%	
Organic Matter	1-2%	GREAT
	5% or less	GOOD
	8-10%	OK
	10% or more	BAD
Used Bedding Bacterial Counts		
Gram negative	Less than 1,000,000 cfu/g	
Coliform bacteria	Less than 100,000 cfu/g	
Klebsiella	Less than 100,000 cfu/g	
Streptococcus	Less than 1,000,000 cfu/g	
Fresh Bedding Bacterial Counts		
Gram negative	Less than 5,000 cfu/g	
Coliform bacteria	Less than 5,000 cfu/g	
Klebsiella	Less than 5,000 cfu/g	
Streptococcus	Less than 5,000 cfu/g	

Standards used by Dr. Joe Hogan, DVM of Ohio State University