Sand as an alternative litter material

Different types of materials are currently used as litter by the poultry industry. Traditional bedding materials include hard-wood or pine shavings and rice hulls. The choice of material used is dependent upon local availability and relative cost of the materials. In many regions of the U.S., including Kentucky, the availability and cost of conventional litter sources has become a problem, increasing interest in alternative litter materials. A number of universities have been studying the use of sand (commonly mortar sand) as litter in broiler houses.

Mortar sand has been screened and washed free of fines. It is the finest sand generally available and has a high percolation rate (i.e., the rate, usually expressed as a velocity, at which water moves through saturated granular material – a high rate indicates that water will drain through at a very high rate). The removal of fines results in a material with minimal binding qualities. This type of sand is great for creating very loose soil mixes. The particles are slightly smaller than washed concrete sand.

Use of sand allows producers to grow consecutive flocks over long periods without completely removing all organic matter. Field trials in sand houses in Alabama have produced more than 20 consecutive flocks of broilers while only removing a small portion of the organic matter. Problems could arise with this practice, however, due to concerns of accumulation of nutrients and organic matter while rearing consecutive flocks.

Because rearing broilers on sand is a new technique for American producers, many questions are yet to be answered. Research has shown that broilers raised on sand perform as well as or better than those raised on pine shavings. In fact, in some cases male broilers raised on sand outweighed their counterparts raised on pine shavings. It has been speculated that this is due to a depression of feed intake resulting from litter consumption in broilers reared on pine shavings. Foot pad quality has also been shown to improve with broilers raised on sand. With the increased relative value of paws today, this is an important consideration. Additional positive benefits associated with the use of sand as litter include less dust, lower darkling beetle levels, and less caking. There are reports of beneficial effects related to litter temperatures, with the temperature being 2°F cooler in summer and 2°F warmer in winter months.

Bacteriologically, sand is equivalent or slightly superior to pine shavings when used as poultry litter. Coliform (including E. coli) and aerobic plate counts were significantly lower when sand was used as the litter material. Wood fiber-based litter materials have been reported to contain relatively high aerobic bacteria counts and fungal populations.

Sand litter does have potential problems, however. Initial weight of the sand is typically 8-9 times greater than pine shavings. This amount of weight may require modification in methods that are typically used in handling litter. Weight could also be a problem in relation to transportation. Typically, as the weight of a material increases, the cost of transportation also increases. Depending on the depth, the quantity of sand needed to bed a 40 x 500 ft broiler house would be 187-280 tons.

The amount and type of bedding, frequency of removal, broiler market weights, nutrition and feed utilization efficiency, and numerous management factors influence litter rates and values. Poultry litter, on average, contains a fertilizer value of 3-3-2 (N-P-K). It has been reported that phosphorus levels were nearly 10% less in sand litter. This finding is considered environmentally desirable because poultry litter application rates are based on phosphorus levels in many regions.

Because sand weighs 300 to 400% more than pine shavings, increased acres of cropland would be needed when sand litter is applied on a per-ton basis. Although sand may allow producers to avoid cleaning out for a number of years, total weight of litter at the end of that period may be close to what would have been removed from houses bedded with pine shavings with yearly cleanout. When sand litter is completely removed, an alternative disposal method may be needed unless sufficient agronomic acreage is available.
Brooding on sand litter could be more difficult than with current bedding types. Results showed significantly higher chick mortality and feed conversion from the houses bedded with sand. This may be related to brooding temperatures. Low brooding temperatures have been shown to adversely affect broiler performance and increase mortality.

Depending upon the cost of alternative litter sources, brooding and clean-out programs, and market age, sand has a payback period of 1.5 years. Previous reports from poultry producers using sand bedding have stated that the cost of sand is similar to the cost of pine shavings over a 1.5- to 2-yr period. Sand is sustainable economically but may turn producers away because of high initial placement cost.

Pros:
- May be local sources available
- A reusable bedding material
- Reduced darkling beetle activity

Cons:
- Substantial increase in the amount of material needed
- Need to use the correct type of sand
- Higher initial cost
- Specialized equipment required
- May require initial heating of the sand before placing a flock.

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Sand could be an alternative if no other bedding material is available and your integrator accepts it as a suitable litter material.