Introduction to Bedded Pack Manure Management

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Why Bedded Packs?

Pros

• Protect water quality
• Improve soil quality
• Animal health & comfort
• Higher air quality
• Conventional manure handling

Cons

• High bedding costs & changing availability
• High labor/management
• High maintenance, structure costs
• Handling manure multiple times
• If not maintained properly, high SCC
Bedded Pack Variables

- Variables of animal type, age group, length of time on pack, bedding type, frequency and volume of new bedding
- Goals of herd health, animal comfort, air quality, ability to check/socialize animals
- Goals of manure management, soil quality and fertility improvement
- Avoid lagoon construction/expansion
Regular, Consistent Management

Guy Choiniere adds new bedding with shredder daily
Vermont Bedded Packs: 5 Cases

Days on pack: 180-360
Animals: 25-90 dairy

Annual operating expenses:
$9,914-$40,726  median: $14,848

Operating expenses per animal/day:
  $2.07 to $5.03  median: $2.75

Annual labor hours: 42-567  median: 206

Wood chip base - shavings and rock dust added to shredded hay
Shavings with a chip base and occasional round bale.
Narrow wood chips
Vermont Bedded Packs: Survey

- 70% took 15-30 minutes to manage pack daily
- 1-14 days to clean out pack
- $100-$3,000 to clean (labor + equipment)

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Cover-all Barn Provides Good Light/Ventilation
Alternating panels provide cover and light.
Combining shelter and fresh air
Design Considerations
Pack moisture targets

• Total pack moisture 63% (above 70% can expect leaching/free moisture)
• Surface moisture less than 40% (dry surface for animals to lay on)
• Sun/wind can promote surface drying
• Damp/humid weather can wet fresh bedding even before manure/urine
• Extra bedding may be needed around waterers/animal congregation areas
• Shredded hay/straw more absorbent
Soil additives through pack bedding
Chickens grazing for bugs/feed
Animal health on the pack

• Lower lameness rate (4.4% compared to cross- and naturally ventilated free stalls at 13.1% and 15.9%)
• Mastitis was reduced by 12% in 6 out of 9 farms (see study)
• Improved reproductive performance on 4 out of 7 farms (26% heat, 34.5% pregnancy rate)
Pack is sloped upwards alley to wall
Hay without woodchips/shavings
Converted free-stall barn
Partially finished compost now windrowed for further break down
One year-old compost
Where to Stack Pack?

Barnyard at this site drains to lagoon
Windrow and stack of bedded pack
2018 Figures and Economics

• $30/cow/year. $22.70/ cow on the base. The remainder for topdressing.
• Using about 2.5 4×5 round bales/day for 86 cows. Reed Canary grass & swamp hay.
• ~150 cu. yds on the base & 50 for topdressing. Top dressing about $.04/cow/day. Labor: variable. Currently 1.5 hrs/day÷86 cows
• Woodchips were $13/cu. yd. Delivered.
• Courtesy of Mark Russell
Fournier Pack - Clean out in July
Fournier Pack - Layers of Moisture/Decomposition
Areas of concentrated moisture - waterers/hydrants
Pack accumulation against concrete sidewall - plan for depth/durability
Transfer pack manure to composting site
Pack windrowed on site with good setback from surface water and at intended field for compost application
Fournier -
Spreader for pack material
Bed chain and aggressive beaters
Handling Strategies - Options

• Full clean-out and windrow at designated spreading site for composting
• Windrow within bedded pack structure - partially compost to reduce volume and trips to field/site after a few weeks/months of decomposition
• Spread in fall with aggressive spreader
• Bury corncobs/other feed for pigs to dig and "turn over" the pack in summer
Precomposting with pigs
Bedded pack facilities can be very successful and beneficial if managed properly!