Is there anywhere it makes sense to describe herds overall fit into “low” categories from jayarao’s paper? How many /21 herds fall into this category?

More details on bedding depth measurement from TA observations for materials and methods

**Text to keep just in case:**

*Was another way of writing summary of univariate results:*

Farms with deeper bedding showed a tendency toward a lower bulk tank SCC (deep bedding lying surface vs. mattress/concrete, p = 0.14; depth of bedding in stalls, p = 0.06), lower % neSCC (depth of bedding in stalls, p = 0.02), lower % elSCC (p = 0.01), lower average LS (depth of bedding in stalls p = 0.05 and 0.10, respectively), lower mean udder hygiene score (deeply-bedded stalls vs. mattress/concrete, p = 0.06; depth of bedding in stalls p = 0.07), and lower proportion of dirty udders (deeply-bedded stalls vs. mattress/concrete, p = 0.06; depth of bedding in stalls p = 0.13). Farms with lower mean udder hygiene scores tended towards having lower % ceSCC (proportion dirty udders and mean hygiene p = 0.05), lower % elSCC (proportion dirty udders, p = 0.13; mean hygiene, p = 0.09), and lower average LS (proportion dirty udders, p = 0.12; mean hygiene, p = 0.11). Increased bedding depth measures also tended to be associated with lower mean udder hygiene scores (deeply-bedded stalls vs. mattress/concrete, p = 0.06; depth of bedding in stalls, p = 0.07; bedded pack depth p = 0.01), as well as lower proportion of dirty udders (deeply-bedded stalls vs. mattress/concrete, p = 0.06; depth of bedding in stalls, p = 0.13; bedded pack depth p ≤ 0.001).

Although the mean CFU/mL of *Staph.* spp. in bulk tank milk was numerically higher for tiestall farms than freestalls or bedded packs, this group contained an outlier (one farm with 665 CFU/mL). When the analysis was re-run without this farm included, the mean and SD for each of the three groups was much more similar [BP: 53 CFU/mL (49); FS: 66 CFU/mL (48); TS: 76 CFU/mL (60)].

While the possibility exists that coliform counts in our milk samples may be artificially decreased due to time stored in freezer, the low streptococcal counts among herds enrolled in this study is an additional sign that the herds enrolled in the current study have excellent milking time hygiene, as streptococci counts have been shown to not decrease with time stored in the freezer (Schukken et. al, 1989).

The mean non-*ag Strep.* counts for tiestalls was numerically higher than the other 2 facility types, but this was due to a significant outlier. Without this outlier, the mean non-*ag Strep.* counts for each of the three facility types were more similar, although tiestalls were still somewhat higher [BP: 39 CFU/mL (25); FS: 89 CFU/mL (98); TS: 145 CFU/mL (110)].

*Stuff from that starting discussion paragraph/conclusions section:*

However, few Vermont dairy producers actively manage their bedded packs with tilling, and alternatively, are using static bedded pack systems (reference Tuckers paper).

*Section describing limitations of BTM interpretation:*

Can be a highly specific, poorly sensitive test to screen herds for major mastitis pathogens (*Staph. aureus, Strep. uberis)*; if present in BTM culture, reliably indicate intramammary infections due to that pathogen on the farm. However, environmental bacteria unlikely to be indicative of proportion of cows infected with these organisms. May enter into BTM from milk with an intramammary infection, but also can get into BTM from non-specific contamination; can maybe indicate general level of environmental and milking hygiene in the herd … Bacteria present in milk samples from the bulk tank may originate from infected udders, from teat and udder surfaces, or from a variety of other environmental sources

*Discussion, comparing BP udder health metrics to other facility types:*

Although the metrics studied have been varied, overall previous research has also found that udder health and milk quality measures on bedded pack farms are similar to that found on farms using more traditional facility types (Barberg et al. 2007b; Shane et al. 2010; Lobeck et al. 2011; Black et al. 2013; Eckelkamp et al. 2016b; Eckelkamp et al. 2016a; Heins et al. 2019).

*From conclusion (too long): univariate summary*

Overall, farms with more deeply-bedded cows had improved BTSCC, udder health metrics and hygiene scores. Unsurprisingly, better udder hygiene was associated with improved udder health measures.