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Enviro-Dri improves BALB/c nude breeding performance in isolator

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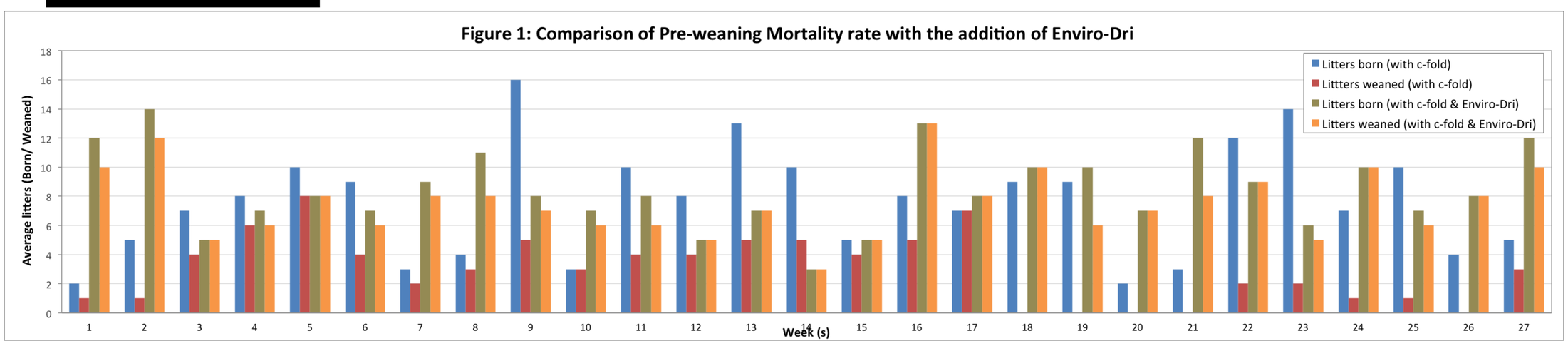
I. BACKGROUND

Active breeding trios are by default supplied with autoclaved c-fold towels as a nesting material. However, immuno-compromised mice such as BALB/c nude has a poor breeding efficiency – good number of litters born but a high prewean and post wean mortality observed. Hence a more robust nesting and enrichment material was sourced to improve the cage environment suitable for these nude mice.

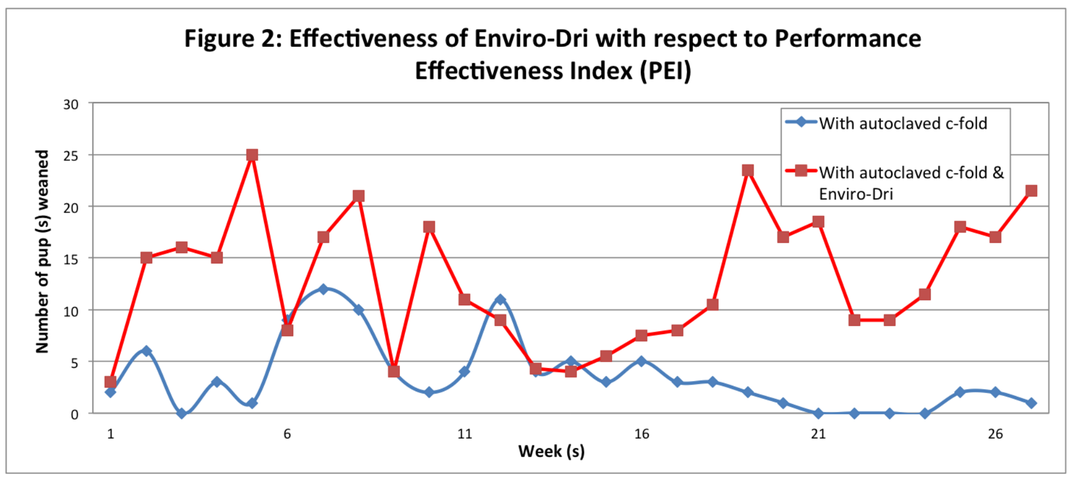
II. METHOD

60 trios BALB/c nudes (1 male nude: 2 female hets)	
30 trios	30 trios
Autoclaved c-fold towel (2pcs)	Autoclaved c-fold towel (2pcs) + Enviro-Dri (8-10g)
Data collected for period of 6months	

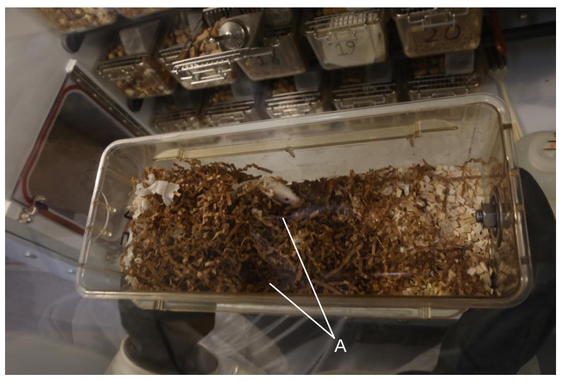
III. RESULTS



Week (s)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Litters lost (with c-fold)	1	4	3	2	2	5	1	1	11	0	6	4	8	5	1	3	0	9	9	2	3	10	12	6	9	4	2
Litters lost (with c-fold & Enviro-Dri)	2	2	0	1	0	1	1	3	1	1	2	0	0	0	0	0	0	0	4	0	4	0	1	0	1	0	2



Picture 1: Top dome removed exposing the heart of nest. Shredded c-fold towel used as base layer while Enviro-Dri forms the structure for dome-like shaped.



Picture 2: Full dome-shaped nest with two exit holes (Point A).

Advantages	Disadvantages
• Reduced mortality of both pre and post weaners • Bigger and much active nude weaners • High number of pups weaned	• Time consuming as pups may be well hidden in nest network. Needs to comb through the nesting materials during bedding change • Increased occurrence of cage flood • Expensive

Table 1: Advantages and Disadvantages of using Enviro-Dri as nesting material.

Picture 3: Side view of a complete isolator cage unit showing a full dome-shaped nest.

Picture 4: Cages with c-fold towel as its only source of nesting material form an incomplete dome-shaped nest.

IV. DISCUSSION

In Fig 1, the litters which were weaned out is notably higher in cages with Enviro-Dri added ($C_{enviro\text{-}dri}$) as compared to cages with only c-fold towel added ($C_{c\text{-}fold}$). This means that the prewean mortality is lesser in $C_{enviro\text{-}dri}$ as compared to $C_{c\text{-}fold}$. There were only four occasions this is not true and that is because, the slight difference of about one to two litters is due to an all-heterozygotes litter and this is not counted as a litter weaned. The same trend can also be seen in the higher number of nude pup survival to weaning (Figure 2).

The presence of Enviro-Dri and c-fold towel as a nesting material allows the mice to replicate their natural environment where nests in the wild mostly consists of several material mix. Being able to build a better nest could have addressed the issue of thermal disparity needs among the cage occupants. All these positive results translate to a rise in Performance Effectiveness Index (PEI) which is calculated as pups weaned/dam/week. A rise in PEI equates a better breeding performance. Not only the breeding performance is better, the nudes that were weaned out are generally more sturdy and does not require wet mash to be given as part of diet and thus recorded a low number of death amongst post weaners.

Overall, the results collated proves that the addition of Enviro-Dri has greatly benefitted the BALB/c nude colony due to the increase in nude pup survival to weaning, rise in the colony's Performance Effectiveness Index (PEI) and reduction in post-weaning mortality.

CONCLUSION

The provision of Enviro-dri coupled with c-fold towel gave the mice a great source of material mix to build better nest and consequentially improved the breeding performance of the colony in the isolators.

A FUTURE DIRECTION

Moving forward, using the data and info obtained to try to create the same environment in an IVC setting as breeding in isolator is much more labour intensive and operationally more costly.

REFERENCES

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