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Letters

Dear Editor,

We would like to respond to the editorial letter from Dr. Roger Orcutt that was published in the August 2000 issue of Comparative Medicine. Dr. Orcutt took exception to our use of the term "containment" in our manuscript entitled "Containment of *Helicobacter hepaticus* by use of husbandry practices" (1). We would like to point out that this study design included cages of mice experimentally infected with *H. hepaticus* that were housed in close proximity to helicobacter-free mice. Over the study period of 15 weeks, husbandry methods utilizing microsolator caging, changing cages of heliocobacter-free mice before cages of experimentally infected mice and use of forceps to handle mice, effectively demonstrated that horizontal transmission of *H. hepaticus* from cages of helicobacter infected to helicobacter-free mice was prevented. Thus, careful evaluation of our study leads to the conclusion that *H. hepaticus* was both contained to the cages of experimentally infected mice and excluded from cages of mice that remained helicobacter- free throughout the study. Of note, the term "containment" was used in the manuscript title and the terminology of preventing horizontal transmission was used numerous times in the text, both of which connote that *H. hepaticus* was "contained" within specified cages.

We appreciate Dr. Orcutt's contributions to gnotobiology but believe he did not evaluate this study objectively and should retract his criticism.

Thank you,
Mark T. Whary, DVM, PhD, ACLAM

1. **Whary, M. T., J. H. Cline, A. E. King, C. A. Corcoran, S. Xu, and J. G. Fox.** Containment of *Helicobacter hepaticus* by husbandry practices. Comp. Med. **50:**78–81.

Dear Editor,

Our article entitled "Eradication of infection with Helicobacter spp. by use of neonatal transfer" in the August 2000 issue of Comparative Medicine contains a citation error. Helicobacter primers H276f and H676r are described in reference 28 of the paper rather than reference 14. The correct reference is **Riley, L. K., C. L. Franklin, R. R. Hook, Jr., *et al.*** 1996. Identification of murine *Helicobacters* by PCR and restriction enzyme analyses. J. Clin. Microbiol. **34:**942–946.

Sincerely,
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Age Differences In Thickness Of The Epidermis Of Miniature And Domestic Swine.

A general methodological mistake, when comparing miniature with domestic swine, is that weight categories are compared, instead of comparison of age groups. In the article by Eggleston et al., Comparison of Two Porcine (*Sus scrofa domestica*) Skin Models for In Vivo Near-Infrared Laser Exposure. Comp. Med. **50:**391–397, Yorkshire pigs and Yucatan minipigs of 14-36 kg and 13-29 kg respectively were compared, without stating the age of the animals. It is my guess that the Yorkshire pigs were six weeks (14 kg) to 13 weeks (36 kg) old, whereas the Yucatan minipigs approximately were eight weeks (13 kg) to 26 weeks (29 kg) old. Thus, there was an age difference of a factor two between the heaviest pigs of each group.

That age is an important factor for thickness of the epidermis, was concluded in a study by Qvist et al. (Evaluation of Göttingen Minipig Skin for Transdermal In Vitro Permeation Studies. Eur. J. Pharmaceut. Sci. **11:**59–68). The skin of minipigs of 6, 13 and 26 weeks old (3, 7 and 13 kg respectively) were compared to skin of the domestic pig and to human skin (breast and abdominal skin). The skin of the miniature and domestic pigs originated from the dorsal neck.

The thickness (micrometers, mean ± sd) of the epidermis of the minipigs was 50.0 ± 5.5 (6 weeks), 64.0 ± 0.0 (13 weeks) and 63.0 ± 5.3 (26 weeks). The dermis had a thickness of 1.15 ± 0.11, 1.47 ± 0.19 and 2.28 ± 0.11 respectively. The thickness of the epidermis and dermis of the domestic pig was 50.0 ± 5.5 and 1.56 ± 0.03 micrometers respectively. The domestic pigs had a weight of 20 kg, and were approximately 8 weeks old.

From these results, it can be concluded that skin thickness of pigs is depending on age and that miniature and domestic pigs of similar age can be compared. However, comparison based on body weight cannot be made, since miniature and domestic pigs of similar body weight have a considerably different age. The finding from Eggleston et al. that Yucatan minipigs have a thicker skin than domestic pigs is therefore incorrect. The pig data may have been pooled, if animals of similar age were used.

With this, I would like to state the importance of mentioning complete animal data in the Materials and Methods section, since this often is essential for the interpretation of results, especially with swine studies. As a model, the Utstein-Style Guidelines for Uniform Reporting of Laboratory CPR Research. Circulation. **94:**2324–2336 could be used. In cardiovascular research the main large animal models are dogs and swine, and as a minimum the Utstein-Style Guidelines recommend to include species, gender, age range and weight range in the Materials and Methods, and preferably also breed, supplier and living conditions. By doing so, both good science and responsible animal use are served.

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Ellegaard Göttingen Minipigs
Denmark

Response to Peter Bollen's Letter

Mr. Bollen makes a lucid argument for the lack of age-matching in our comparison analysis. Age-matching is appropriate when comparing two groups of animals to make them as closely matched as possible. However, the objective of this study was not to find a swine model based on the ages of pigs. The objective was to determine the best swine model to use as a statistically representative model for the potential exposure of humans to hazardous lasers systems. For our purposes the age of the pig was not directly relevant, but the size of the pig was. It is quite possible that the epidermal thickness of more mature Yorkshire pigs may be thicker than that of the samples used in our study, and thus more similar to that of the Yucatan minipigs or the human samples. However, the analysis of Yorkshire pigs that were in the same age range as our Yucatans would not have been practical, as they would then have been too large to be easily accommodated in the apparatus used for laser exposures. Furthermore, melanin content at the basal layer was a crucial component of our study. Thus epidermal thickness was only one important variable to consider.

In addition, the study conducted by Qvist, et al. states clearly that "the species of the pig and the age of the minipig had only a small influence on the thickness of the stratum corneum and epidermis". No age comparison was completed in the Yorkshire pig, and only three data sets (number of data points per set not reported) were obtained for each of the three ages for minipigs. In our study we obtained a total of 6 data sets for each site from both the Yorkshire pigs and the Yucatan minipigs. Each of these data sets contained ten data points, for a total of 60 data points per site, permitting us to obtain 95% confidence limits with statistically relevant standard deviation.

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