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Short Communication


Hearing range of the domestic cat

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The behavioral audiograms of two cats were determined in order to establish the upper and lower hearing limits for the cat. The hearing range of the cat for sounds of 70 dB SPL extends from 48 Hz to 85 kHz, giving it one of the broadest hearing ranges among mammals. Analysis suggests that cats evolved extended high-frequency hearing without sacrifice of low-frequency hearing



100- Cat A
90- 45Hz



100- Cat B
90- 64 kHz



quencies of 500 Hz and below, a 7.5 cm wide range speaker for 1-2 kHz, and a ribbon tweeter

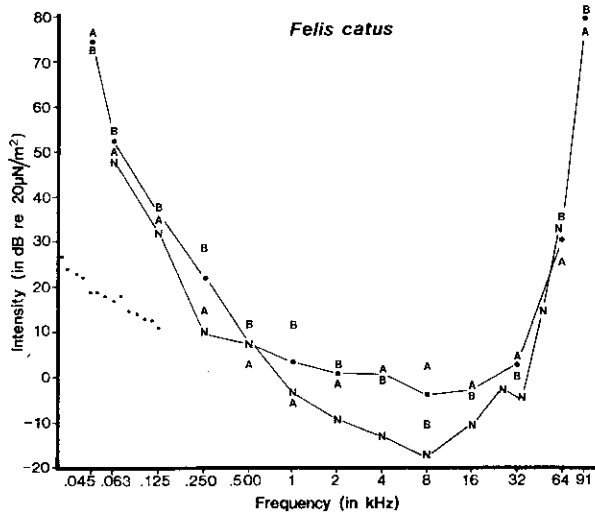


Fig. 2. Audiogram of two cats (A and B) compared with a previous cat audiogram (N) by Neff and Hind [11]. Dots indicate measurable background noise intensity.

the low-frequency range. Though Neff and Hind were concerned that their 62.5 Hz threshold might have been confounded by overtones, the average thresholds of the two studies are within 5 dB at this frequency. Second, in the midrange, the two audiograms show a noticeable difference especially at 4 kHz and 8 kHz where they differ by 14 dB and 13 dB, respectively. However, cats typically appear to differ in the midfrequency range with Neff and Hind's three animals differing by 17 dB at 4 kHz. Such variation between cats in the

of other mammals it is now apparent that the cat has one of the broadest hearing ranges among mammals whose hearing is known. At a level of 60 dB SPL, the cat's hearing range is 10.5 octaves (as compared to the human hearing range of 9.3 octaves), a range which is barely exceeded only by cattle and porpoises [5,7].

Analyzing the cat's audiogram, it appears that its broad hearing range is due both to its good high-frequency and its good low-frequency hearing. In mammals, high-frequency hearing ability is correlated with functional interaural distance such that mammals with small interaural distances are better able to hear high frequencies than are larger mammals (e.g. [5,8]). This relationship, which is explained in terms of the need to localize sound, predicts that the 60 dB high-frequency limit of the cat would be 46.5 kHz. In actual fact, the cat's high-frequency limit is 78 kHz which is 0.8 octaves higher than expected and accounts for part of the cat's broad hearing range. More notable, however, is the cat's good low-frequency hearing. Among terrestrial mammals, low-frequency hearing is strongly correlated with high-frequency hearing such that mammals with good high-frequency hearing generally do not have good low-frequency hearing and vice versa (e.g. [4-6]). The cat, however, appears to have increased its high-frequency hearing without any sacrifice in low-frequency hearing. That is, while its high-frequency hearing limit leads to a predicted 60 dB low-frequency hearing limit of 595 Hz, the cat's actual low-

2 Elliott, D.N., Stein, L. and Harrison, M.J. (1960): De-

8 Masterton, B., Heffner, H. and Ravizza, R. (1969): The