
It has been found in *Drosophila melanogaster* that the amount of alcohol dehydrogenase (ADH) protein and ADH activity per unit body weight increases with increasing body weight (Kamping & Van Delden 1978; Clarke et al. 1979; Van Dijk 1981). Clarke et al. (1979) further showed that increasing the quantity of yeast in the food medium resulted (up to a certain limit) in increased body weight and quantity of ADH. In selecting for increased tolerance to hexanol-1 by exposing monomorphic Adh<sup>S</sup> and Adh<sup>F</sup> strains to hexanol-1 for 90 generations, Van Delden & Kamping (1983) found an increase in tolerance, both in the egg-to-adult and adult life stages. The increased resistance to hexanol in the tolerant strains (SSH and FFH) was accompanied by an increase both in body weight and ADH activity of adults (with the exception of SSH males) compared with the control strains (SSC and FFC) which were continuously kept on regular food.

To examine the effects of yeast content on tolerance to hexanol and other alcohols in relation to body weight and ADH activity, first experiments were started in which the yeast content in the medium was varied. In addition to regular food, consisting of 1000 ml water, 19 g agar, 54 g sucrose, 32 g dead yeast and 13 ml nipagin solution (10 g nipagin dissolved in 100 ml 96% ethanol), food was prepared with various amounts of dead yeast (0, 4, 8, 16, 64 and 96 g per liter medium). Eggs of each of the SSH, FFH, SSC and FFC strains were collected and transferred to each of the seven media with different yeast amounts. The number of eggs per bottle was such that the larvae grew up under uncrowded conditions. When the flies were hatched ADH activity of whole fly homogenate of 6-day old males was assayed as described by Van Delden et al. (1975). ADH activity was determined in batches of 25 males (2 replicas per strain) and expressed in Δ E mg⁻¹ min⁻¹ x 10⁻³. Body weight was determined in batches of 10 males (5 replicates per strain).

The results are shown in Table 1; no data are given for the 0 g yeast level, as no flies were obtained. It is clear that increasing the amount of yeast in excess of the amount present in regular medium (32 g per liter medium) does not result in higher body weight or ADH activity. At the lower yeast amounts applied in this study, however, both body weight and ADH activity decrease. In agreement with the results of Van Delden & Kamping (1983) there are no differences between the males of the SSC and SSH strains, neither for body weight nor for ADH activity at none of the yeast levels. Also in agreement with previous results are the higher body weights and ADH activities found in FFH males compared with FFC males. However, it is clear that this phenomenon only occurs at the higher yeast levels where, as shown, both body weight and ADH activity are maximized. At the 16 g yeast level (half of the content of regular medium) and at the lower levels, the differences between FFH and FFC disappear. It thus appears that the rise in body weight and ADH activity observed in FFH males is conditional on the yeast amount in the medium.