Supplementary Methods

Feeding assay. 2-3 day-old virgin females (15 animals/vial) were conditioned for 4 days to the specific nutritional regime to be tested. Flies were then transferred to the same medium containing 1.4 Ci/ L dCTP[-32P] (MP Biomedicals, Irvine, CA) and allowed to feed for 24 h, then transferred to empty vials to groom for 30 min (to ensure removal of any cuticular radioactive deposits), anesthetized by cold and assayed in 10ml scintillation fluid (Research Products International Corp.), using a Beckman LS 5000 TA Liquid Scintillation System. Each experiment included two standards of 20 Ci dCTP[-32P] diluted in water (1:10000 volume:volume), which were used to perform the conversion from scintillation counts to food volume. Signal incorporation over both the 24 h test period and an extended 72 h period was near-linear.

Food media. Flies were raised to adulthood on Lewis medium (*Drosoph. Inf. Serv.* **34**, 117). The media employed for dietary manipulation consisted of varying concentrations of sucrose and autolyzed yeast extract (Bacto™ Yeast Extract, B.D. Diagnostic Systems, Franklin Lakes, NJ) diluted in a binder of 8% cornmeal, 0.5% bacto-agar and 1% propionic acid. 1X food was defined as 1% sucrose + 1% yeast extract.

Lifespans. Virgin females were collected under brief carbon dioxide anesthesia. Lifespans were conducted with ~40 animals per vial at 25ºC on a 12/12h light/dark cycle. Fresh food was provided and deaths scored every 2 or 3 days. Data were analyzed using Graphpad prism software.