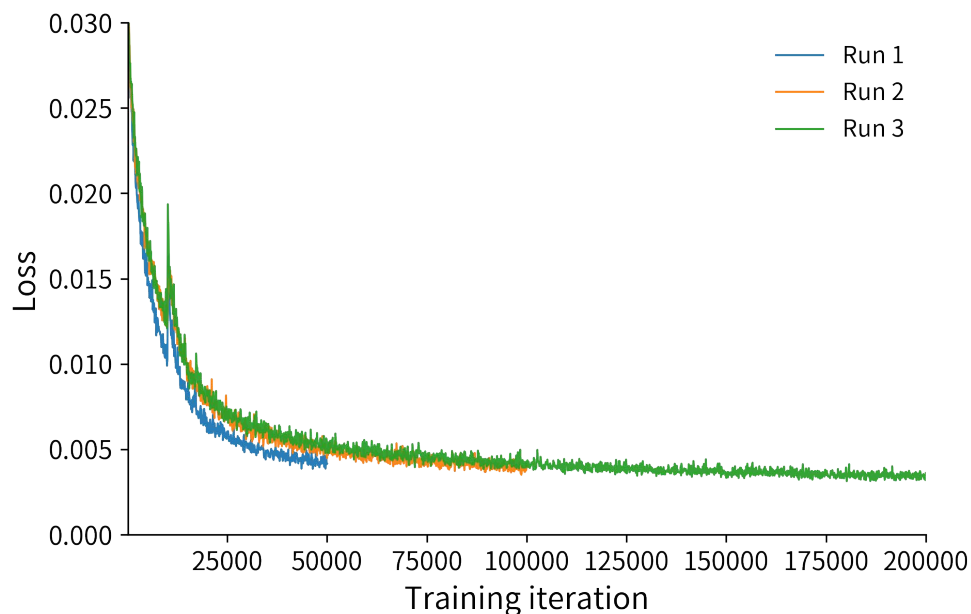
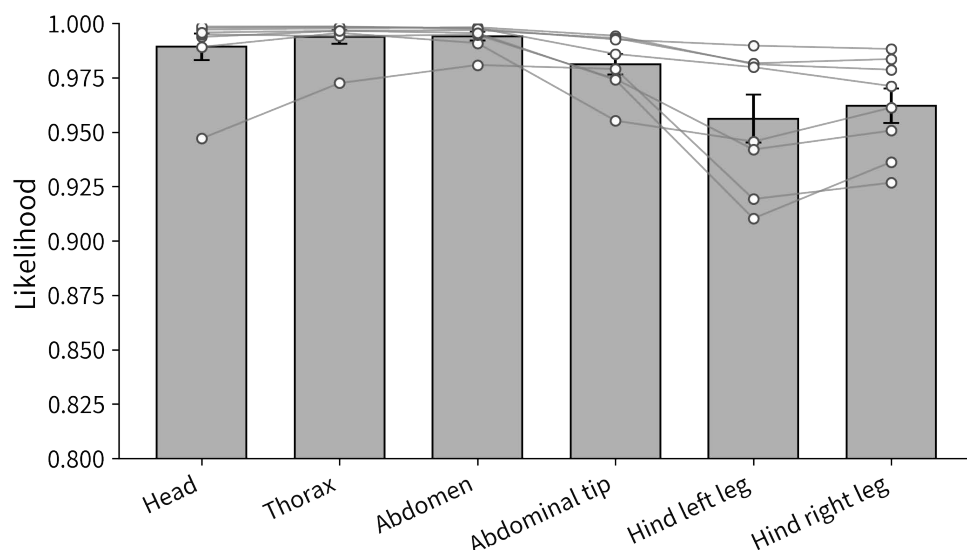


Figure. S1

a

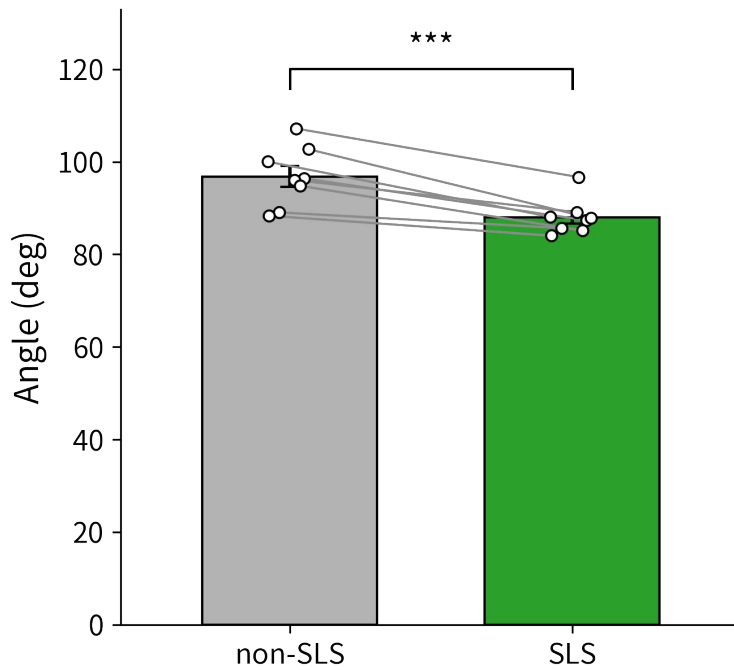


b



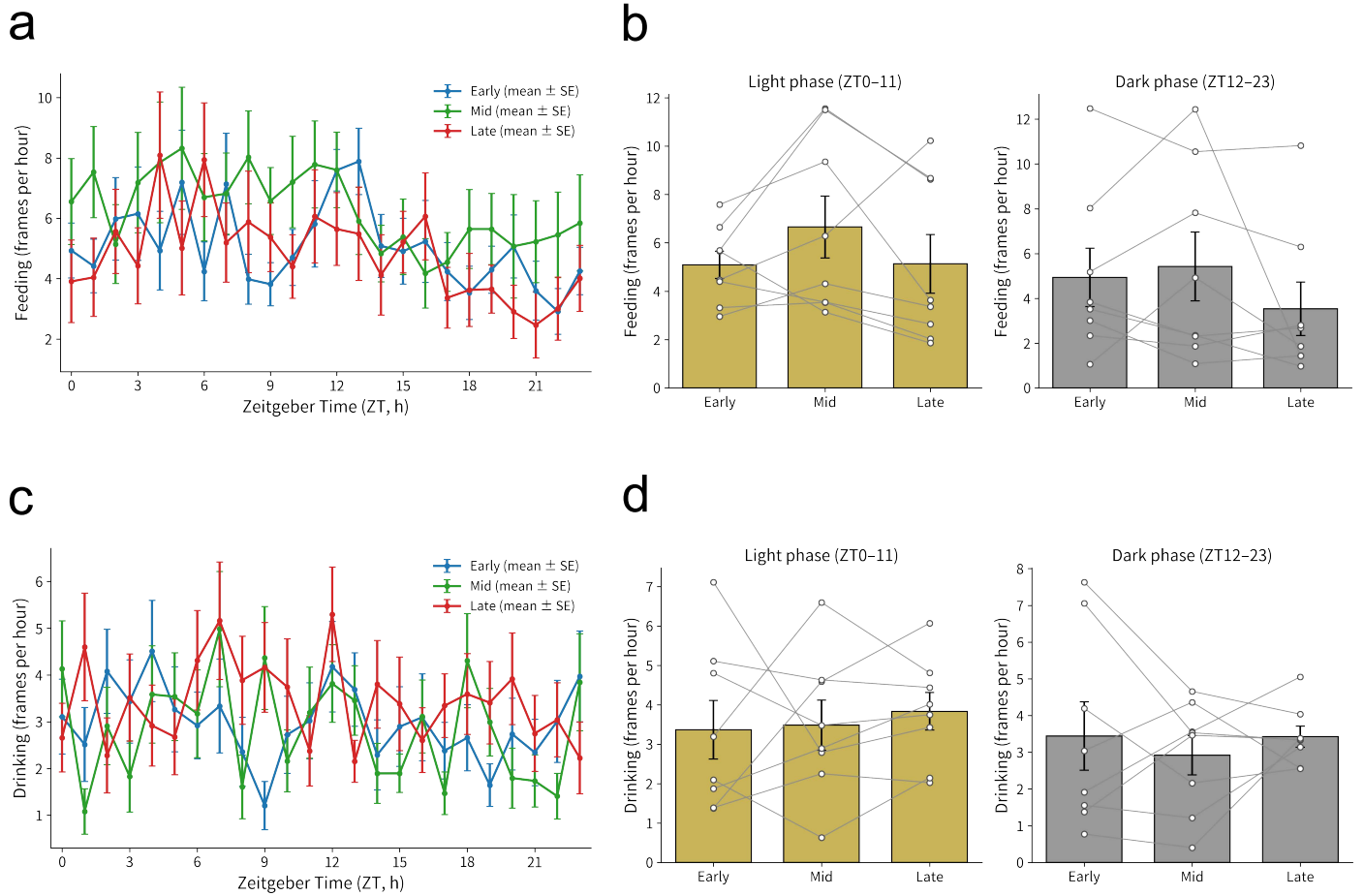
**Fig. S1. Evaluation of DeepLabCut training and tracking quality.** (a) DeepLabCut training loss curves across iterations. A supervised training dataset was generated by randomly sampling 220 images (11 individuals  $\times$  20 frames) and used to train the network for three runs with different iteration budgets (Run 1: 50,000 iterations; Run 2: 100,000 iterations; Run 3: 200,000 iterations). The plot shows loss as a function of training iteration for each run, indicating a progressive decrease in loss and a convergent trend with increasing iterations. (b) Per-individual mean keypoint likelihoods for six annotated body parts (head, thorax, abdomen, abdominal tip, hind left leg, hind right leg). Bars indicate the mean likelihood across individuals ( $\pm$  SEM), and gray lines/points show values for each individual. The y-axis is restricted to 0.8–1.0 to highlight differences in high-confidence tracking.

Figure. S2



**Fig. S2. SLS-dependent change in the abdomen–hind leg angle.** Angle was defined by three point coordinates (abdomen, left hind leg, and right hind leg). Bars show the mean angle  $\pm$  SE across individuals (non-SLS, gray; SLS, green); paired individual means are shown as white points connected by lines. The angle was significantly lower in the SLS condition than in the non-SLS condition (two-sided paired t-test on per-individual means; \*\*\* $P < 0.001$ ).

Figure. S3



**Fig. S3. Feeding and drinking activity across Zeitgeber time and across the adult lifespan.** (a) Zeitgeber time (ZT) profiles of feeding frequency (frames per hour) after dividing the adult period into lifespan-normalized thirds (Early, Mid, Late). Lines show mean  $\pm$  SE. (b) Mean feeding frequency in the light phase (ZT0–11) and dark phase (ZT12–23) for each lifespan third. Bars show mean  $\pm$  SE; paired individual values are connected by lines. Asterisks indicate significant pairwise differences among thirds (paired Wilcoxon tests with Benjamini–Hochberg FDR correction within each phase). (c) ZT profiles of drinking frequency (frames per hour) across lifespan thirds (Early, Mid, Late). Lines show mean  $\pm$  SE. (d) Mean drinking frequency in the light phase (ZT0–11) and dark phase (ZT12–23) for each lifespan third. Bars show mean  $\pm$  SE; paired individual values are connected by lines. Asterisks indicate significant pairwise differences among thirds (paired Wilcoxon tests with Benjamini–Hochberg FDR correction within each phase)

**Movie.** Example labelled video output from DeepLabCut. The trained model automatically overlays the predicted positions of the six cricket keypoints on each frame in both the light and dark phases.