

Supplemental Fig. 1. Flow charts depicting the formation of the 21 study groups and the fates of each group's members. Boxes represent study groups and numbers in parentheses are numbers of spiders.

Supplemental Fig. 2. Legend to Supplemental Figs. 3-7. The sequence of compounds shown, top to bottom, is the same sequence presented in the bar charts in Supplemental Figs. 3-7. Note that taurine was not detected in any webs of *Araneus cavaticus*, *N*-acetylputrescine and putrescine were not detected in webs of *Argiope aurantia*, and free proline was not detected in webs of *Argiope trifasciata*. Also, one or more additional compounds went undetected in some web collections or, though detected, were so minor as to not be discernible when so plotted. Remember that feeding group individuals were different from individuals composing the starving group, but all resumed feeding group members were former starving group spiders.

Supplemental Fig. 3. Absolute (upper panel) and relative (lower panel) quantities of LMM in water extracts of webs built by *Araneus cavaticus* juvenile males in feeding and starving/resumed feeding groups. Average desiccated web weights within web collections are indicated by line graphs in the upper panel (right y-axis). See Supplemental Fig. 2 for legend.

Supplemental Fig. 4. Absolute (upper panel) and relative (lower panel) quantities of LMM in water extracts of webs built by *Araneus cavaticus* juvenile females in feeding and starving/resumed feeding groups. Average desiccated web weights within web collections are indicated by line graphs in the upper panel (right y-axis). See Supplemental Fig. 2 for legend.

Supplemental Fig. 5. Absolute (upper panel) and relative (lower panel) quantities of LMM in water extracts of webs built by *Araneus cavaticus* adult females in feeding and starving/resumed feeding groups. Average desiccated web weights within web collections are indicated by line graphs in the upper panel (right y-axis). See Supplemental Fig. 2 for legend.

Supplemental Fig. 6. Absolute (upper panel) and relative (lower panel) quantities of LMM in water extracts of webs built by *Argiope aurantia* adult females in feeding and starving/resumed feeding groups. Average desiccated web weights within web collections are indicated by line graphs in the upper panel (right y-axis). See Supplemental Fig. 2 for legend.

Supplemental Fig. 7. Absolute quantities of LMM in water extracts of webs built by *Argiope aurantia* (upper panel) and *Argiope trifasciata* (lower panel) adult females following the construction of first (PES 1), second (PES 2), and third (PES 3) egg sacs. Average web weights within web collections are indicated by line graphs (right y-axis). The collection of webs from the *A. aurantia* PES 3 group was ended prematurely (see Materials and methods). See Supplemental Fig. 2 for legend.

Supplemental Fig. 8. Average ranked molar percentages of the 12 LMM in webs of the three study species. Taurine was not detected in any webs of *Araneus cavaticus*, free proline was not detected in webs of *Argiope trifasciata*, and *N*-acetylputrescine and putrescine were not detected in webs of *Argiope aurantia*. Ala, alanine; Bet, glycine betaine; Cho, choline; GAB, GABamide (4-aminobutyramide); Gly, glycine; Ise, isethionate; NAP, *N*-acetylputrescine; NAT, *N*-acetyltaurine; Pro, proline; Put, putrescine; Tau, taurine.