Supplemental Table 1: Diet formulations for experiments (g). 100%, 65%, and 30% were used in the first experiment and consisted of bulk dilutions.

| Diet component         | 100% | 65%  | 30%  |
|------------------------|------|------|------|
| Dried pinto bean powder| 100  | 65   | 35   |
| Fortified yeast        | 21.3 | 13.85| 7.455|
| Ascorbic acid          | 4    | 2.6  | 1.4  |
| Methyl paraben         | 1.5  | 0.98 | 0.53 |
| Sorbic acid            | 0.67 | 0.44 | 0.24 |
| Propionic acid         | 0.5  | 0.33 | 0.18 |
| Agar                   | 9    | 5.85 | 3.15 |
| Cellulose              | -    | 47.9 | 95.9 |
| ddH₂O                  | 560  | 560  | 560  |
| Diet component          | Amount  |
|-------------------------|---------|
| Casein                  | 33      |
| Dextrose                | 33      |
| Wheat Germ              | 28      |
| Wesson Salt             | 9       |
| Ascorbic Acid           | 5       |
| Cellulose               | 4.7     |
| Sodium alginate         | 4.7     |
| Cholesterol             | 1.8     |
| Methyl Paraben          | 1.5     |
| Sorbic acid             | 0.5     |
| Cholin chloride         | 1.1     |
| Agar                    | 26      |
| Wheat germ oil          | 5 mL    |
| dH$_2$O                 | 400 mL  |
Supplementary Figure Legends:

SI Figure 1: Influence of *Enterococcus* FAW21 on fall armyworm (A-C) and beet armyworm (D-F) pupation metrics. Axenic fall armyworm had greater larval mortality prior to pupation (A) took longer to develop (B) and were smaller (C) compared to those inoculated with *Enterococcus* FAW2-1. Axenic beet armyworm did not differ in their ability to pupate (D) but developed faster (E) and were larger (F). * = p<0.05; ** = p<0.01; *** = p<0.001.
SI Figure 2: Body mass of fall armyworm (*Spodoptera frugiperda*) and beet armyworm (*Spodoptera exigua*) over time in response to inoculation by *Enterococcus* FAW21. The black arrow signifies transfer of larvae to new diet, with the red arrow signifying the onset of beet armyworm pupation. Data illustrated on upper graph as log-scale.
**SI Figure 3**: Influence of delayed introduction of *Enterococcus* FAW21 on fall and beet armyworm larval growth on pinto bean diet. Larvae were inoculated for the duration of the second instar after being reared on wheat germ diet for the duration of the first instar. Larvae were then transferred to pinto bean diet for the duration of the experiment (10 days). Asterisks represent statistically significant differences. *** = p<0.001.
SI Figure 4: Influence of Enterobacter on fall armyworm larval growth on pinto bean diet. Larvae were inoculated for the duration of the second instar on wheat germ diet before being reared on pinto bean diet.
SI Figure 5: Body mass accumulation of fall and beet armyworm to *Enterococcus* FAW21 on wheat germ-based diet after 10 days.