Yeast derivatives and wheat germ modulates fecundity and nutrient content in the South American fruit fly

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INTRODUCTION

Anastrepha fraterculus (Wiedemann) is a pest of great economic importance in South America for which the Sterile Insect Technique is promoted. Because oogenesis takes place during the adult stage, mass rearing facilities should provide females a diet that maximizes egg production at the lowest cost.

OBJECTIVE

Evaluate the effect of yeast derivatives of different cost, the addition of wheat germ (Gran Diet, Buenos Aires, Argentina) and different ratios of these ingredients on female performance; as well as their association with female nutrient content.

MATERIALS AND METHODS

- **Ovary maturation** was assessed dissecting virgin females daily to estimate the percentage of sexually mature females.

- **Fecundity and fertility** were evaluated on groups of five laboratory mated females.

- **Nutrient content** was determined for newly-emerged, sexually mature virgin females (10-d-old) and mated females (14-d-old) following Bradford’s method for proteins and Van Handel’s method for lipids, carbohydrates and glycogens.

RESULTS

Females fed hydrolyzed yeast (MP Biomedicals®) and yeast extract (Bionis® YE MF) attained the highest fecundity levels and those fed brewer’s yeast (CALSA®) the lowest. The addition of wheat germ in the adult diet improved fecundity.

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<th>Yeast derivatives</th>
<th>Yeast extract</th>
<th>Wheat germ</th>
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<tbody>
<tr>
<td>Hydrolyzed yeast</td>
<td>Brewer's yeast</td>
<td>Wheat germ</td>
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<td>1:3:1</td>
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Egg hatch was not affected by the diet and nutrient content of females varied according to the adult diet, age and mating status.

CONCLUSIONS

- **Hydrolyzed yeast can be replaced in the adult diet by other yeast derivatives as yeast extract.**

- **Wheat germ emerges as a relevant component of the adult diet.**

- **Females resigned fecundity but not fertility when fed a yeast-reduced diet.**

- **Females were not able to compensate high protein deficiencies in the adult diet from reserves obtained during the larval stage.**

- **Further research are needed to promote brewer’s yeast adoption in the adult diet as a low cost alternative.**