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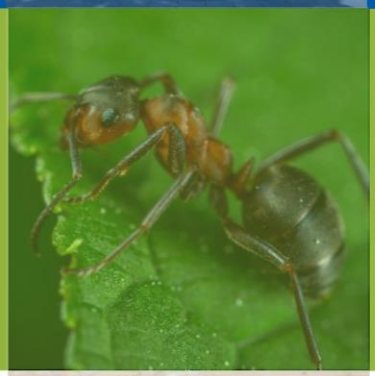
Bornimer Agrartechnische Berichte

INSECTA 2023

International Conference



Book of Abstracts

13th and 14th September 2023
Magdeburg, Germany

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Iso waste-based diets as substrate for yellow mealworm larvae

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Yellow mealworm usually grows on dry substrates derived from cereal production, which already have an application in feed industry. The study aims to evaluate the effects of agro-industrial waste and by products combined in iso-nutrient (gross energy, crude protein (CP) and ether extract (EE)) formulations on larval growth and chemical composition. In addition to the control diet (C, wheat bran), 3 dietary treatments were tested (5 replicates/treatment; 10000 larvae/replicate). Waste-based diets were mainly composed by feed and breading waste (FW and BW, respectively) as follows: (TM1) FW and BW + wheat groats, wafer dough, dry stillage and silvery film, (TM2) FW and BW + wafer dough and panettone waste and (TM3) FW + BW + rice by-products. The trial started with 3-weeks-old larvae (WOL) that were weighted every week until the end of larval growth, which was considered when the difference in percentage of the weight between two sampling times was equal or lower to 50%. At the end of the trial, the biomass was weighed and the total number of larvae was estimated. To determine the dry matter (DM), CP, EE, ash and chitin content, larvae were freeze-dried. Data were analyzed by One-way ANOVA (SPSS, v28.0). Until 6 WOL, no difference in terms of growth were observed ($p>0.05$). At 7 WOL, TM1 larvae showed the best growth ($p<0.05$), followed by TM2-3, which performed similarly ($p>0.05$). The C diet displayed the worst growth ($p<0.05$). At 8 and 9 WOL, the growth patterns were the same, as TM3 and C larvae were the heaviest and lightest ($p<0.05$), respectively. The TM1-2 groups were similar ($p>0.05$) and intermediate between TM3 and C ($p<0.05$). At 10 WOL, all treatments were statistically different and, in the weight-scale, were positioned as follows ($p<0.05$): TM3 (0.127g), TM2 (0.118g), TM1 (0.113g) and C (0.087g). As concern the chemical composition, the C group showed lower DM and EE, as well as higher CP and ash content, when compared to the other diets ($p<0.05$) – which were equal in terms of DM, EE and CP ($p>0.05$), while ash was higher in TM2 than TM1 ($p<0.05$). In conclusions, despite the larvae being fed on iso-nutrients diets, the growth performance was affected by the dietary treatment, with TM3 diet – composed by FW, BW and rice by-product – displaying the best results.