UNIVERSITÀ DEGLI STUDI DI PADOVA
DAFNAE
Department of Agronomy Food Natural resources Animals and Environment

INfoodSECT

INnovative functional FOOD products and ingredients from inSECTs

The project aims to develop a multidisciplinary model to foster insect acceptance andconsumption as alternative new ingredients intended for foods that could contribute toboost a sustainable food production and the development of added-value, healthy foods.Two insects, Tenebrio molitor (yellow meal worm) and Acheta domesticus (house cricket),recently approved for human consumption by the EU, have been identified for theirgrowing role at national and international level. The project is based on a comprehensiveexperimental design that, in sequence, will study i) the chemical, physical, microbial,safety and technological properties of commercial insect powders and lactic acidfermented commercial insect powders from the two selected insects; ii) the developmentand the analysis (chemical, technological, bioactive capacities after in-vitro digestion,starch digestibility and predicted glycaemic index) of two types of products with enhancednutritional and qualitative properties, i.e. leavened salted crispbread and unleavenedsweet biscuits; iii) the application of conventional and innovative processes to isolateprotein fractions from insects and to modify their structures, enhancing their bioactive andfunctional properties. The project will be implemented by a Response SurfaceMethodology approach to optimize raw material exploitation, new ingredient structuringand high-added value products, and will be completed by sensory testing to monitor theacceptability of the new foods enriched with insect powder, as well as shelf-life trials toassess their susceptibility to insect attack. Lastly, the evaluation of the health andnutritional value of the ingredients will be assessed with in vitro approaches for future foodapplications. The envisaged new high-added value foods are “source of protein” or “high-protein” bakery products, whose demand is expected to increase in the next years, due to trend of more sustainable diets. The 2-years project activities are organized in five WorkPackages (WPs) that will be carried out by the Research Units of three universities (Milan,Padua and Florence). The methodological approach is characterized by the interplay ofdifferent applied food-related expertise (biochemistry, chemistry, entomology, microbiologyand technology) in a multidisciplinary environment. Overall the INfoodSECT project willgenerate new knowledge and test methodological approaches to valorise insects that willpositively impact the selected processing chains and, in a wider perspective, improve theresilience of agro-food chains, by addressing the food-related targets of the SustainableDevelopment Goals of

United Nations and by contributing to the Food 2030 EU's researchand innovation policy to transform food systems. The project is expected to have a socialand economic impact and to support Italian food industry, boosting sustainability andinnovation.

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