Summary of the dossier: whole and grinded *Alphitobius diaperinus* larvae products

Applicant: Proti-Farm Holding NV, Harderwijkerweg 141B, 3852 AB Ermelo, Netherlands.

This novel food dossier contains the application for the novel foods status of whole and grinded *Alphitobius diaperinus* larvae products, needed for authorised use in the EU food ingredient market according to Regulation (EU) No 2015/2283. This application for authorisation falls under the transitional period for insect products that currently have been lawfully placed on the market. *Alphitobius diaperinus* larvae are more commonly known as the lesser mealworm larvae (LMW), and are a source of natural and sustainable essential ingredients, like proteins, vitamins and minerals.

The larvae used for the production of LMW products have a short life cycle, and are reared in a closed farming system on 100% vegetable GMP+ certified feed (substrate group A: Animal feed materials according to the EU catalogue of feed materials (Regulation (EU) No 68/2013) and authorized as feed for food producing animals). After fasting, the live whole LMW are A) blanched, frozen and/or grinded, or B) blanched, frozen, dried and/or grinded. These processes result in four products:

1. whole blanched and frozen LMW;
2. Paste: whole blanched, grinded and frozen LMW;
3. whole blanched, frozen and freeze dried LMW;
4. Powder: whole blanched, frozen, freeze dried and grinded LMW.

These LMW products will be targeted at the general population, and sold as a protein rich ingredient with a broad application in a variety of food categories.

Main constituents of LMW products are water (in the non-dried forms), protein (all essential amino acids), fat (largely unsaturated fatty acids) and chitin. The products are at least a source of vitamin B2, B3, B5, B9, B12 and the minerals zinc and copper. The protein quality is high for all amino acids, except for the sulphur amino acids (good quality), according to the limits set by FAO (FAO, 2013). The protein is not completely digested due to the presence of chitin, but still has an overall good bioaccesibility.

Analyses and scientific studies show no safety concerns for heavy metals, mycotoxins, pesticides, prions, flame retardants, PCBs, DDT, and dioxin compounds. Total polyphenol content was low, demonstrating that there are no concerns on quinones either as a naturally derived component or a process related component. Antinutritional factors are also known to be present in only low concentrations. The microbial data does not exceed the limits as set in Regulation (EC) No 2073/2005 and the levels advised by NVWA. Concentrations of chitin are not likely to exceed the level mentioned in the EFSA Opinion on chitin-glucan (EFSA NDA, 2010) based on the calculated anticipated intake data. When maximum use levels are observed, no adverse nutritional effects are expected when LMW products are habitually used in the European dietary context.

Literature search did not reveal concerns regarding the absorption, digestion, metabolism and excretion of proteins, minerals, chitin and amino acids. Based on the low concentrations of undesired compounds, no toxicological studies have been performed.

High allergenic potential and cross-reactivity from LMW warrants mandatory allergenicity labelling, as cross-reactivity exists with crustaceans, molluscs and house dust mite and the product contains gluten.

We conclude that the LMW products are safe as a food ingredient at the proposed conditions of use and the proposed intake levels.