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Viruses in insects for food and feed

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Abstract

The use of insects as food for humans or as feed for animals is an alternative for the increasing high demand for meat and has various environmental and social advantages over the traditional intensive production of livestock. Mass rearing of insects, under insect farming conditions or even in industrial settings, can be the key for a change in the way natural resources are utilized in order to produce meat, animal protein and a list of other valuable animal products. However, because insect mass rearing technology is relatively new, little is known about the different factors that determine the quality and yield of the production process. Obtaining such knowledge is crucial for the success of insect-based product development. One of the issues that is likely to compromise the success of insect rearing is the outbreak of insect diseases. In particular, viral diseases can be devastating for the productivity and the quality of mass rearing systems. Prevention and management of viral diseases imply the understanding of the different factors that interact in insect mass rearing. This publication provides an overview of the known viruses in insects most commonly reared for food and feed. Nowadays with large-scale sequencing techniques, new viruses are rapidly being discovered. We discuss factors affecting the emergence of viruses in mass rearing systems, along with virus transmission routes. Finally we provide an overview of the wide range of measures available to prevent and manage virus outbreaks in mass rearing systems, ranging from simple sanitation methods to highly sophisticated methods including RNAi and transgenics.

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