

**EDITORIAL****Edible Insects Regulatory National Standards in Kenya: An Incentive or a Deterrent?****John Kinyuru^{1,2}, Nancy Ndung'u³**¹*Jomo Kenyatta University of Agriculture and Technology, Department of Food Science and Technology, Nairobi. P.O. Box 62,000 – 00200 Nairobi, Kenya.*²*Africa Institute for Capacity Development, Nairobi, Kenya*³*Jomo Kenyatta University of Agriculture and Technology, Department of Agricultural and Resource Economics*Corresponding email: jkinyuru@agr.jkuat.ac.ke**1.0 Introduction**

Different wild collections of edible insects have been reported variously in the last decade. An overview of the global scene indicates that there is an unqualified and virtually untapped opportunity. Therefore, there is a need to focus not just on increased production but also on increased utilization as an ingredient in food and feed. This may enhance the supply of high-value nutrients for humans and livestock as the insects supply a balance of energy, protein, fats, vitamins, and minerals (Kinyuru et al., 2015). Improvements in technologies and practices in farming have been shown to improve productivity and enhance the nutritional value of insects (Kinyuru & Kipkoech, 2018; Malinga et al., 2018, 2022), which means that high-value food products can be developed, therefore.

2.0 Edible insect food and feed products

Post-harvest loss for edible insects in the East Africa region is generally low due to high consumer demand. However, on rare occasions of glut, a 20–30% loss may be witnessed, mainly due to a lack of adequate storage infrastructures such as refrigeration, storage capacity, and shelf-stable products. The most common value-added edible insect products in the markets are minimally processed insects, mainly deep fried, although some variations, such as smoked fried grasshoppers, can also be found. Ultra-processed insect-based products are rare and most have been reported as the work of research by scientists. The demand for minimally processed insects is high enough to reduce the chances for highly processed, value-added products. However, with increased farming techniques being studied and promoted, opportunities for developing highly and ultra-processed products will unfold.

3.0 Kenya national standards

In Kenya, four national standards have been developed to regulate the use of edible insects in the food and feed industry. The standards intend to support individuals and industry players interested in edible insects to invest in the sector and not in any way restrict the insect types or substrates for rearing.

**3.1 KS 2921:2020 - Production and handling of insects for food and feed - Code of practice**

This code of practice provides the requirements for the sustainable establishment and operation of wild-harvested or domesticated insect farming; production; harvesting; and post-harvest handling; i.e., processing, storage, packaging, labelling, and transport of insects for human consumption and the feed industry. The code has an annexe which provides general guidance for semi-cultivation of insects and wild harvesting. However, the code of practice does not apply to the food and feed industries where value-added edible insects and insects for feed are processed into final products.

3.2 KS 2711:2017 - Dried insect products for compounding animal feeds - Specification

This standard specifies the requirements for dried insect products as sources of protein for compounding animal feeds. Based on the developed technology, it is technically feasible to produce insects on a large scale and to use them as an alternative, sustainable protein-rich ingredient in cattle, fish, pigs, and poultry diets. This standard will assist both manufacturers of insect products and animal feeds to maintain good quality and exercise proper quality control during production.

3.3 KS 2922-1:2020 - Edible insects specification Part 1: Edible insects products

This standard specifies the requirements, sampling, and test methods for edible insect products intended for human consumption. The standard defines edible insect products as products that have been processed from edible insects harvested either from domesticated farms or from the wild and presented in the form of whole insects, milled, paste, liquid/aqueous or powder form. The standard defines a whole insect product as an edible insect product either whole or where some inedible parts of the insects, such as wings or gut hair, have been removed during or after drying. A powdered insect product is defined as a particulate product of dried insects that is achieved by milling or grinding a dry whole insect product.

3.4 KS 2922-2:2020 - Edible insects specification Part 2: Products containing edible insects

This standard specifies the requirements, sampling, and test methods for products containing edible insects as an ingredient intended for human consumption. According to the standard, a product containing edible insects is a ready-to-use product or a product which will require further processing before consumption whose ingredients include edible insect products such as cookies, biscuits, snacks, flours, and bread. It further specifies that products containing edible insects shall have at least 10% of the ingredients from dried insects' products complying except for wheat-based baked products, which may contain at least 5% dried insects.

4.0 Operationalization of the standards

The Kenya Bureau of Standards carries out quality inspections of local products and imports covering food, beverages, vegetable oils and fats. In addition, KEBS conducts market surveillance to monitor the quality and safety of goods in the local market, thereby protecting Kenyan consumers from substandard and unsafe products. KEBS is therefore mandated by law to enforce the edible insects' standards and issue certification. Under the Standards Act (Cap 496), certification programmes are conducted on all processed food products destined both



for export and domestic markets. All insect products that meet the standard specifications are therefore issued with a KEBS Standardization mark (S-Mark), which is affixed on all products sold in Kenya. The standardization process is ongoing, and the permit is renewed every year on payment of a fee.

5.0 Conclusion

From the onset, the standards are intended to support the food and feed industries, and every edible insect industry player is expected to adhere to the specifications. The standards safeguard the quality and safety of edible insect products, thus avoiding jeopardizing human and animal health. The standards also create a level playing field for the industry, thus giving everyone a fair opportunity. They are therefore an incentive to the industry rather than a deterrent.

6.0 References

- Kinyuru, J., & Kipkoeh, C. (2018). Production and growth parameters of crickets in Kenya: experiences from a farm in a high altitude, cooler region of Kenya. *Journal of Insects as Food and Feed*, 4(4), 247–251.
- Kinyuru, J., Mogendi, J. B., Riwa, C. A., & Ndungu, N. W. (2015). Edible insects - a novel source of essential nutrients for human diet: Learning from traditional knowledge. *Animal Frontiers*, 5(2), 14–19. <https://doi.org/10.2527/af.2015-0014>
- Malinga, G. M., Acur, A., Ocen, P., Holm, S., Rutaro, K., Ochaya, S., Kinyuru, J. N., Eilenberg, J., Roos, N., Valtonen, A., Nyeko, P., & Roininen, H. (2022). Growth and Reproductive Performance of Edible Grasshopper (*Ruspolia differens*) on Different Artificial Diets. *Journal of Economic Entomology*, 115(3), 724–730. <https://doi.org/10.1093/JEE/TOAC053>
- Malinga, G. M., Valtonen, A., Lehtovaara, V. J., Rutaro, K., Opoke, R., Nyeko, P., & Roininen, H. (2018). Mixed artificial diets enhance the developmental and reproductive performance of the edible grasshopper, *ruspolia differens* (Orthoptera: Tettigoniidae). *Applied Entomology and Zoology*, 53(2), 237–242. <https://doi.org/10.1007/s13355-018-0548-x>