Climate, Land, Agriculture, and Biodiversity (CLAB-Africa)

POLICY BRIEF

Creating policy for the safe and regulated use of insects in livestock feed in South Africa

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Summary

Alternate sources of protein for use in livestock feed are gaining popularity in South Africa – one of these being edible insects. The use of edible insects for this purpose is a new development in South Africa, thus policy needs to be developed and implemented to regulate the production, processing, packaging, and utilisation of edible insects in livestock feed to ensure proper quality and safety standards are maintained. These policies should be developed such that they provide actionable and regulatory guidelines, promote research and development, incentivise investment and adoption, enhance consumer awareness and acceptance, facilitate market access and trade, support capacity building and skills development, and ensure there is continuous monitoring and evaluation.

Furthermore, additional regulations should be implemented to aid the successful implementation of these policies, including introducing financial support programmes, implementing incentives for research and development, launching pilot programmes, and aiding the creation of partnerships between stakeholders.

This policy brief explores the numerous benefits of and policy recommendations related to the use of edible insects as an alternative source of protein for livestock feed. Creating regulations that support the production of edible insects in South Africa will enable the development of high-quality and safe-for-consumption products that can be utilised locally and internationally as a sustainable source of protein for livestock.

Context

Background

This policy brief forms part of a series of policy briefs across the spheres of climate change, land-use management, agriculture, and biodiversity and outlines the intricate relationships among these, emphasising the need for a holistic approach to policymaking. By addressing these interlinked areas, policymakers can foster sustainable, equitable, and inclusive development that secures food systems, supports rural livelihoods, and combats climate change. This policy brief explores current challenges and provides actionable recommendations relevant to the **people, animal, and ecosystems health and wellbeing** thematic cluster of the Climate, Land, Agriculture, and Biodiversity (CLAB-Africa) project. The aim is to contribute to transforming Africa's agri-food systems to be resilient and sustainable.

This brief explores the benefits of using edible insects as an alternative source of protein in livestock feed in South Africa and the policy recommendations to implement in order to achieve maximum impact in this growing industry. Edible insects have various benefits, including nutritional benefits for livestock, environmental sustainability, economic viability, and growing cultural and market acceptance.

Overview of Research

The challenge

The early stages of an alternative protein source industry are beginning to take shape in South Africa – namely, the use of edible insects in livestock feed. However, no policies are in place to regulate production and ensure that all products are high quality and safe for livestock consumption.

The solution

The One Health approach is defined by the One Health High-Level Expert Panel (OHHLEP) advising the quadripartite (WHO, WOAH, FAO and UNEP) as an integrated, unifying approach that aims to sustainably balance and optimise the health of people, animals, and ecosystems. It recognises that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent (Mettenleiter et al., 2022). The One Health approach is a prominent approach utilised globally, particularly in combating climate change. The One Health approach has even been promoted by the South African President, Cyril Ramaphosa (The Presidency of the Republic of South Africa, 2024).

The growing interest in One Health was evident in the findings of a study that formed part of CLAB-Africa (a Future Africa project hosted at the University of Pretoria), which showed that the this approach is used globally in sustainability research – particularly in the United States of America (USA), United Kingdom (UK), and Kenya. Figure 1 below shows the number of researchers, originating from various countries, identified in the aforementioned study who were utilising One Health in their research during the period 2013–2023.

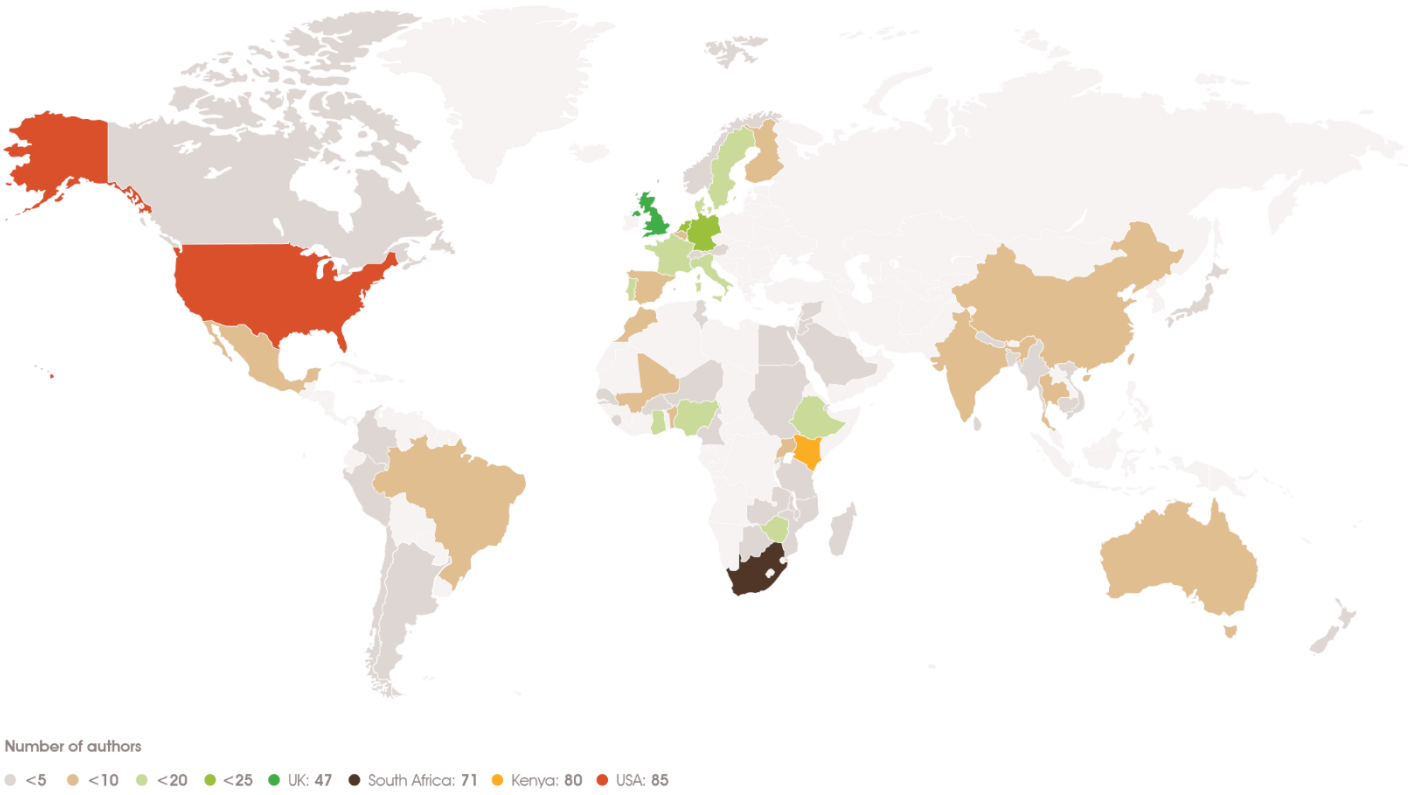

***Figure 1**: Distribution and number of identified authors focusing on One Health in their research*

Creating regulations that follow the One Health approach and that support the production of edible insects in South Africa will create high-quality and safe-for-consumption products that can be utilised locally and internationally as a source of protein for livestock feed. The search on alternative protein sources continues to grow in South Africa, with edible insects being a sustainable option with numerous benefits. The use of insects as livestock feed has numerous benefits. Not only do insects have nutritious qualities that align with the needs of the livestock sector, but they also have a short life cycle, and there is a variety of species to choose from (Hlongwane et al., 2021). Farming insects as an alternative protein source can also help mitigate the ever-increasing effects of climate change because they do not require large areas of land or amounts of water, nor do they produce high levels of greenhouse gases (Van Huis & Oonincx, 2017). Furthermore, edible insects can enable an insect-based circular economy that utilises waste products (Kipkoech et al., 2023). Figure 2 below shows edible insects' nutritional and lifecycle characteristics as well as environmental, economic, biodiversity, social, and agricultural benefits.

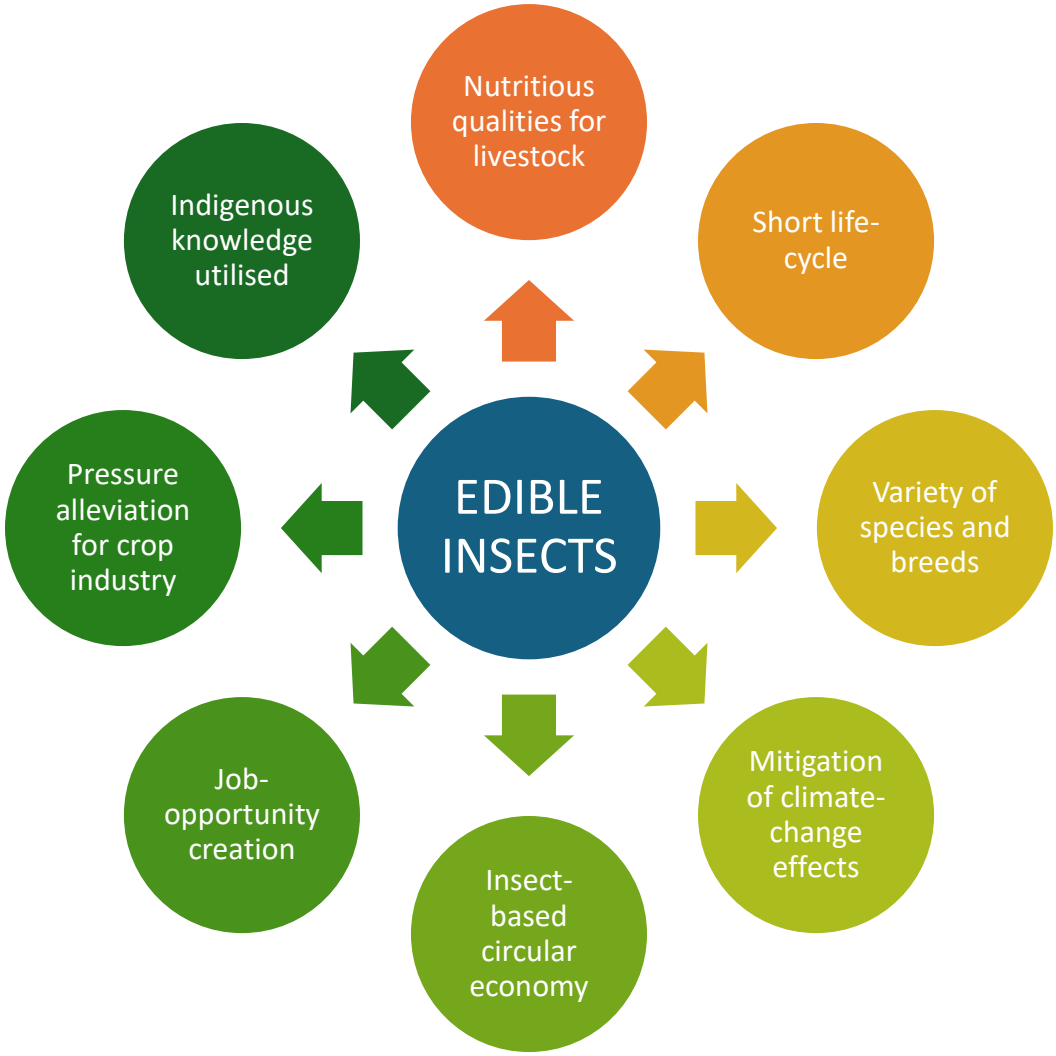

***Figure 2**: Benefits of using edible insects in livestock feed*

Nutritional benefits for livestock

Edible insects, such as the black soldier fly, provide a high-quality protein source to incorporate into livestock feed, which is nutritionally comparable to traditional feed ingredients. Studies have demonstrated that these insects are rich in essential amino acids, fatty acids, and micronutrients that can enhance the overall productivity of livestock, as evidenced by improved growth rates and feed-conversion ratios (Meyer-Rochow et al., 2021; Tang et al., 2019).

Environmental sustainability

Incorporating edible insects into livestock feed offers substantial environmental benefits. Insect farming utilises organic waste, such as food waste and agricultural by-products, as feed for the insects, thereby reducing waste and contributing to circular economy practices.

This recycling process not only lowers the ecological footprint of livestock-feed production but also decreases dependency on conventional feed resources, which often involve environmentally intensive cultivation methods. Research indicates that insect farming requires significantly less land, water, and energy compared to traditional feed crops, aligning with South Africa's sustainability goals (Buitrago et al., 2021; Van Huis & Oonincx, 2017).

Economic viability

The incorporation of edible insects into livestock feed can enhance the economic efficiency of the animal-farming sector. Insect-based feed ingredients can be produced locally at a lower cost than imported fishmeal and soymeal, reducing feed expenses for farmers. Additionally, the establishment of insect-farming enterprises can generate new economic opportunities and stimulate local economies (Onsongo et al., 2018). By fostering a domestic insect feed industry, South Africa can improve food security, create jobs, and support rural development.

Regulatory and safety considerations

To ensure the safe and effective use of edible insects in livestock feed, comprehensive regulatory frameworks are essential. Current research emphasises the need for guidelines to address potential risks, such as the presence of pathogens, toxins, and allergens in insect-based feed. Establishing rigorous safety standards and conducting thorough risk assessments will help mitigate these concerns and build trust among farmers and consumers. Moreover, harmonising regulations according to international standards can facilitate trade and market access (Buitrago et al., 2021; Schlüter et al., 2017).

Cultural and market acceptance

The successful integration of edible insects into livestock feed hinges on cultural acceptance and market readiness. Surveys indicate South African farmers are increasingly open to adopting innovative and sustainable feed alternatives. Demonstrating the benefits of insect-based feed through pilot programmes can encourage acceptance and uptake. Building a positive narrative around edible insects as livestock feed will be crucial for widespread adoption and success (Molieleng et al., 2021; Verbeke et al., 2019).

Policy Recommendations

Develop actionable and regulatory guidelines

Clear and standardised regulations regarding the production, processing, packaging and utilisation of edible insects as livestock feed should be implemented within the next two years to ensure food safety, animal health, and environmental sustainability for all stakeholders across the value chain. This should be followed up with regular monitoring to ensure resilience.

Promote research and development

Assign resources and funding to support research focused on improving insect-based feed formulations and farming techniques and assessing the impacts of insect-based feed. This will encourage collaboration among all stakeholders in the industry to push innovation

and exchange of knowledge in this field over the next five years.

Incentivise investment and adoption

Implement incentives and grants to stimulate investment in insect-farming infrastructure and technology to have sufficient growth by the year 2034. Support small-scale farmers and others wanting to enter the insect-farming industry, thereby fostering resilience within the agricultural sector.

Facilitate market access and trade

Facilitate access to local and international markets for insect-based feed products by creating trade regulations and market standards over the next five years. Nurture partnerships with global stakeholders by maintaining communication and collaboration and hosting conferences and discussions with international partners on a regular basis (at least annually). This will improve and promote South Africa's reputation as a provider of sustainable agricultural products and allow actors in the value chain to make the most of emerging market opportunities.

Support skills development and capacity building

Provide training and capacity-building programmes to supply farmers, processors, and entrepreneurs with the knowledge and skills required to farm edible insects successfully. This will promote job creation within the insect agriculture value chain, particularly in rural and marginalised communities. Extension officers that are supervised are one means by which accurate and reliable information can be relayed to those already involved in production as well as those trying to enter the industry.

Monitor and evaluate the implementation

Include funds for monitoring and evaluating the implementation of insect-related policies, capacity-building programmes, platforms to access the international market, incentive programmes, and research-and-development initiatives in the sector.

Regulations to support the success of policy recommendations

Create incentives and grants to encourage private-sector investment in research and development related to insect-farming technologies, feed formulations, and nutritional studies.

Introduce financial support programmes specifically targeted at small-scale farmers interested in transitioning to insect farming for feed production.

Create pilot programmes and demonstration projects in collaboration with local communities, research institutions, and industry stakeholders to showcase the benefits of insect farming for livestock-feed production.

Aid the creation of partnerships among stakeholders to invest in infrastructure development for insect farming (e.g., insect-rearing facilities and processing plants).

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