

Insect-based feeds for the empowerment of women in Kenya and Uganda

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Context

Poultry and fish farming are among the fastest growing agribusinesses across Africa. However, the high cost of production has kept the end product price above the purchasing ability of the most vulnerable consumers, while at the same time reducing the profit margin for smallholder farmers and, eventually, driving some out of business (Kingori, 2010). Feed alone represents around 70% of input costs in poultry and fish production, and the protein component contributes 60 to 70% of feed cost (van Huis *et al.*, 2013). To cope with this, low quality, low protein content feeds are very common across the continent.

In western Kenya, 76% of poultry production is carried out by women, but monetary-related decisions are mostly made by men. In the poultry and fish value chains, access to, and control over resources and benefits, results in the inclusion or exclusion of players based on social relations. Women's roles and responsibilities confine them to their homesteads, reducing their access to information, technologies, services and markets. Too often, women have less access to, and influence over resources and enjoy fewer benefits than men, and are hence more affected by increasing costs of protein in poultry and fish feed.

Finding an alternative protein source for feed through the establishment of agri-enterprises that produce insects for feed could positively impact continental development, job and wealth creation, food and nutrition security, the environment, and youth and women empowerment. The *Insect feed for poultry and fish production* (INSFEED) project is contributing towards proving this alternative protein source for fish and poultry feeds.

Key messages

- The high cost of animal feed protein constrains vulnerable communities from making a decent living from poultry and fish farming. Insect based feeds have the potential to relieve this burden and empower women and young people.
- During five women-only focus group discussions, the majority of farmers indicated a preference for insect-based poultry feeds over other feed types.
- Results showed that during the dry season, women spend 70.19% of their time doing poultry-related chores, compared to 39.89% for men. Six out of eight poultry-related duties were carried out more frequently by women than by men.
- With women making up 52% of the project's postgraduate students, the project has provided a platform for these young researchers to grow professionally.
- The project has helped build the capacity of young men and women as agripreneurs to increase income generation and food security via insect rearing.

Emerging outcomes

Women are more constrained by the costs of commercial feeds than men

During the initial phase of the project, sex disaggregated focus group discussions (FGDs) with poultry and fish farmers were held on household roles and responsibilities, decision-making, and influence and control over resources in regards to poultry and fish production. Using the information gathered from these FGDs, more detailed questionnaires were developed focusing on the constraints to poultry and fish farming, knowledge and perceptions on the use of insects in fish and poultry feed, and willingness to integrate insects in production. A survey was conducted with 1,325 poultry and fish farmers (265 female- and 1,060 male-headed households), and to 223 traders and feed processors (101 women and 122 men).

In male-headed households, decisions regarding the sale of agricultural products and uses of the money generated are mainly made by men, whilst women tend to make decisions regarding animal feed (Figure 1). Results of the survey showed that women from female-headed households engaged in semi-intensive or intensive poultry farming used expensive commercial pre-mixed feed more frequently than men, who tend to mix their own feed, making them more vulnerable to increasing protein costs.

Women are more likely to adopt the new insect feed than men

When asked about their perceptions of insects as an alternative protein source for fish and poultry feed, women responded more positively than men. In all five women-only FGDs, the majority stated that they preferred insect-based poultry feeds, with four of the groups indicating that insect-fed poultry tasted better than poultry fed on

other protein sources. Conversely, during the three men-only FGDs, most did not have a preference for either the insect-based or non-insect based poultry feed because what was important to them was the size of the chicken.

In the dry season, women spend 70.19% of their time doing poultry-related chores, compared to 39.89% for men. Six out of eight poultry-related duties, including feeding, egg collection and purchasing feeds, were carried out more frequently by women than by men (Figure 2). The remaining two chores – slaughtering and locking away chickens in the evening – were performed by men and women in equal measure. The fact that women are more intensively involved in poultry-related chores, particularly in the purchasing and provision of feed, and their positive responses to insect-based feed during FGDs, suggests that they are more likely to adopt the technology than men.

Sustainably integrating insects into poultry and fish feed creates jobs for women

Of the 28 insect species and instars (developmental stages) assessed for their nutritive value through the INSFEED project, over 90% had higher levels of crude protein, polyunsaturated fatty acids, flavonoids, vitamins and minerals than the commonly used and expensive silver cyprinid fish. If only 5% of poultry feed in Kenya was substituted with insects, at least 32,000 tons of dry insects would be required for poultry feed alone. This represents a huge opportunity for job and wealth creation for young entrepreneurs and underprivileged women who are more likely to take up insect rearing because it can be combined with other tasks women often carry out around the home.

Insect rearing is a sustainable practice that utilizes waste materials from domestic livestock and poultry, can be practiced at home and requires minimal monetary investment. Such work is therefore suitable for women who have limited mobility and access to productive resources, but are likely to have access to farm waste from tending to their animals. In addition, the spent substrate from insect rearing can be used as an organic fertilizer to increase productivity of crops grown for home consumption. This increased productivity and income could improve the food, nutrition and financial security of families.

INSFEED provides a platform for women to grow professionally

The project trained a total of 25 postgraduate students (13 women and 12 men) to conduct insect rearing research, insect nutritive profiling and insect-based feed formulation, as well as performance studies of insect-

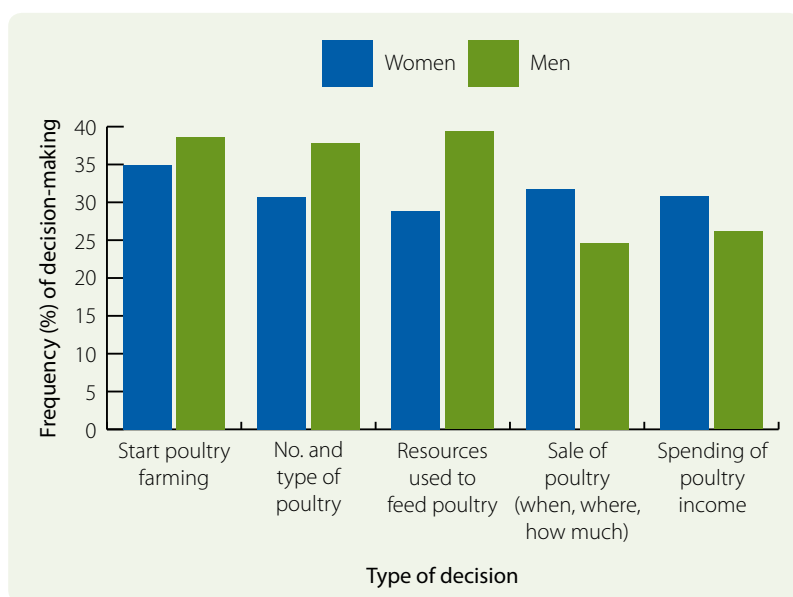


Figure 1: Poultry related decision-making in male-headed households

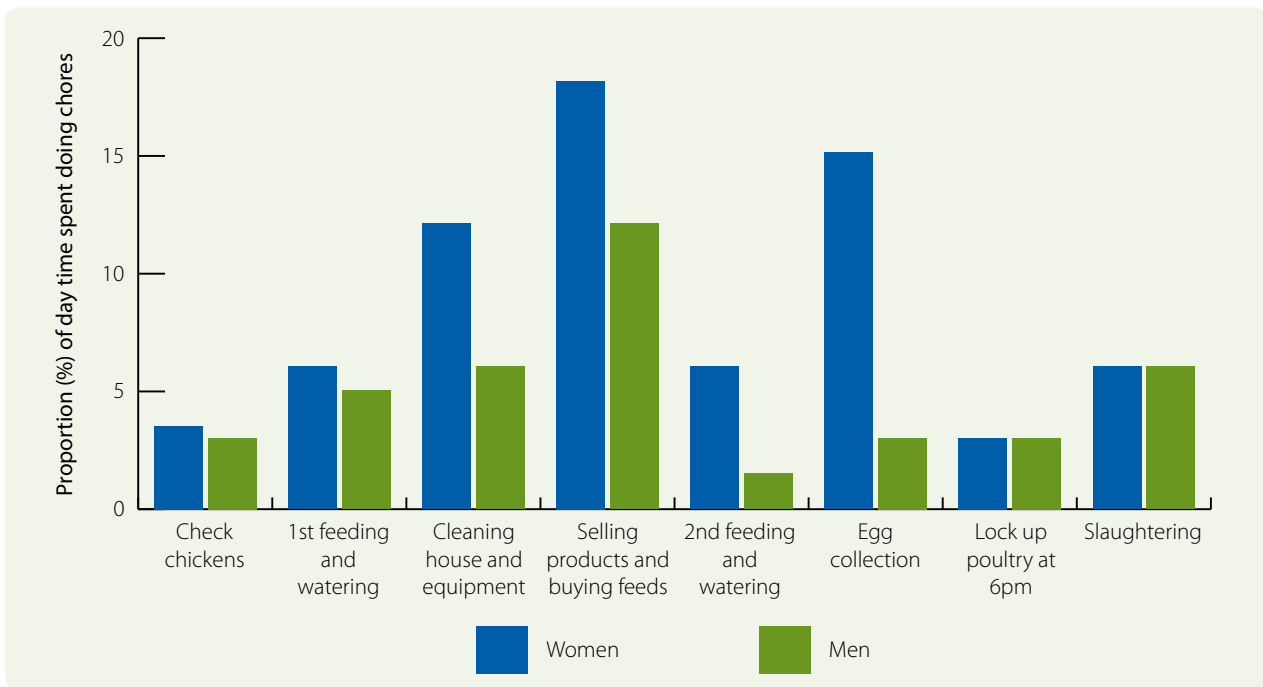


Figure 2: Percentage of day time spent carrying out poultry-related chores in the dry season

based feed for poultry and fish production. The training aimed to strengthen research capacities in national universities, national research centers and international research institutions.

Damaris Wacu Nyngi, a female Kenyan research assistant at the Kenyan Agriculture and Livestock Research Organization (KALRO), has benefited from an MSc stipend and research grant since 2016. She is testing insect based feeds and comparing their performance on layers (chickens raised to lay eggs) against the improved local chicken breed.

“Prior to my MSc work, my role in KALRO involved field visits to farmers and I repeatedly heard farmers complain about the exorbitant cost of feed. I am glad that my results are going to contribute to relieving this burden. I look forward to the day I shall go back to them with the proof that a brighter future is ahead.”

— Damaris Wacu Nyngi, KALRO

Another female researcher, Zainah Nampijja, is conducting similar studies on broilers (chickens raised for meat) in Uganda and shares similar enthusiasm. She worked as a research intern at the Ugandan National Livestock Resources Research Institute (NaLRRRI) before joining the INSFEED MSc program in 2015. Zainah affirms to have found the perfect platform to grow professionally and socially through this project.

Strengthening the capacity of young agripreneurs

Although the INSFEED project was meant to be a proof of concept, a total of 146 young agripreneurs and farmers (54 women, 92 men) were directly trained in insect mass rearing at the International Centre of Insect Physiology

and Ecology (*icipe*), to integrate insects into livestock feed through mass production units and insect-based feed processing.

Kelvin Muaka, a 33-year-old Kenyan pig farmer who coordinates a group of more than 80 farmers, reported facing production constraints due to feed costs. As a cheaper alternative, he purchased 20 kg of Black Soldier flies from South Africa and undertook his own nutrient analysis. On discovering the high nutritive profile of the insect, he undertook a training course with *icipe* in insect mass rearing to establish his own rearing facility in March 2017. Similarly, poultry farmer Wanjira Gitagia also took up insect rearing following INSFEED training, both to feed her poultry and to sell to other farmers.

“I realized that insect farming is not capital intensive and doesn’t require a lot of space.”

— Wanjira Gitagia, farmer

In Uganda, in partnership with another Cultivate Africa’s Future project, *Radio for reaching farmers with research results*, the INSFEED project broadcast insect-for-feed related radio programs. The *Lutabanjaliire* (Luganda language) radio program, aired on two different stations, is a platform where community members discuss farming related issues. Between January 2016 and February 2017, the total number of listeners who called to participate in the radio programs was 35,773.

Enabling policies

Expanding insect mass rearing production and job creation through related agribusinesses will not be possible without establishing favorable social and political conditions to scale up the rearing, harvesting, processing



Lucy Mimano received training at *icipe* on insect rearing and its integration into fish feed

and formulation of insect-based feed. In Kenya, a standard for *Dry Insect Product for Compounding Animal Feed* was approved by the Standard Approval Committee in Kenya in March 2017, and in Uganda in June 2017.

The establishment of a recognized national standard for the use of insects in animal feed will greatly benefit farmers, especially women and young entrepreneurs who are constrained by access to productive resources. It will also enable small, medium and large-scale feed producers to integrate insects in feed production and create a market for women and youths to mass rear insects as a business.

Conclusion

Insect rearing is a sustainable practice that can be carried out from the home with minimal required inputs and is therefore ideal for women farmers who are often constrained by limited access to agricultural resources. Women are more involved in the purchase and provision of animal feed than men, and responded more positively to the idea of incorporating insect-based feeds in production, which indicates that they are more likely to adopt the technology than men.

Gender equitable capacity building for the next generation of scientists and experts in the field of insects for feed, and the provision of equal opportunities for young scientists, were top priorities and achievements of the INSFEED project. The training of young women

researchers in the areas of insect mass rearing and nutritive profiling, has enabled them to build their scientific capacity and use the project as a platform for professional growth.

Progress has also been made towards creating favorable legislation and standards regarding the use of insects in animal feed, which will benefit women and young people hoping to break into this market. Future dissemination of the insect rearing technologies to a wider audience and follow ups with trained agripreneurs, will be required to scale up the inclusion of insects in livestock feed across the continent.

References

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