

Potential for production of edible insects in Kyaka II settlement

Rapid Assessment, December 13.-14. 2018

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Background

Production and consumption of edible insects in refugee settlements in Uganda offers a potential opportunity for new sources of nutrition and income generating activities for both host community members and refugees. However, because production of edible insects is still a very new activity, there are many questions that need to be answered in order to be able to provide a realistic assessment of the feasibility and desirability of initiating edible insect production in Uganda. These questions pertain to the attitude of host community members and refugees towards the consumption of insects, to input markets (i.e. identification of suitable feed), the most suitable production methods and markets for various insect-based products.

In order to begin answering some of these questions, a rapid assessment was carried out in Kyaka II settlement by the Danish NGO Impact Designs, in cooperation with Danish Refugee Council (DRC). Four focus group discussions (FGDs) were carried out, including one with host community members and three with refugees living in Kyaka II settlement (FGDs took place with nationals in Kakoni B, and with refugees in Kakoni A, Mokondo B and Bukere A). Given the limited time for the research, the results presented here should be seen as a very preliminary exploration of key questions.

Attitude to the consumption of edible insects among host community and refugees

There is a long tradition for consuming various insects among both host community and refugees. Among the Ugandans living near the settlement, commonly consumed insects include grasshoppers (Nsenene), white ants and honey bee larvae.

Grasshoppers and white ants are collected from the wild when they are in season, while honey bee larvae are harvested by bee keepers from their own hives. Grasshoppers are a very popular snack, which is usually bought in the market for around UGX 2,000 per cup from the people collecting them (none of the participants in FGDs collected grasshoppers themselves). They are only available around November-December. White ants are similarly either collected from the wild or bought in the markets in the season during May and November, although, according to FGD participants, they are not quite as popular as the grasshoppers.

In addition, it was reported by both nationals and refugees, that children sometimes eat crickets, but that these are not eaten by adults. The reason provided was that people do not like the taste. Crickets are not bought, but only collected from the wild, and according to the nationals interviewed nobody would be interested in buying them and they would not be interested in producing them. The same attitude to crickets was expressed by the Congolese. The Congolese mainly mentioned eating the same insects as the nationals, but were also familiar with the traditional consumption of several other species, in particular the Mopani worm, which is popular in many parts of DR Congo. The vast majority of both nationals and refugees reported having eaten grasshoppers during the last month (November – December).

During the three first focus group discussions, tastings were organised with dried mealworm from a Dutch producer (prepared with BBQ-taste) and the local deep fried Nsenene for comparison. Most of the participants showed no signs of the 'disgust factor' common to cultures not accustomed to the consumption of insects.

However, there were differences in attitudes between participants from different nationalities and ethnic groups: While the Ugandan participants liked the mealworm, they preferred the Nsenene. Participants described the mealworm as a bit dry, lacking in fat, compared to the deep fried grasshoppers. They nevertheless liked the taste of the mealworm, and expressed an interest in producing them.

In the two FGDs with Congolese refugees where people were provided with Nsenene and mealworm, participants liked the taste of the mealworm, even preferring it to the Nsenene.

In contrast, in the FGD in Bukere A, where participants included four Rwandan and three Congolese women, and where a wider range of insect-based products were presented (including both the whole mealworm and various snacks with insect flour), none of the participants wanted to taste mealworm, or any products containing insect flour, and there was a clear disgust factor.

It is not clear whether the difference in the attitude between the Congolese participants in this focus group was because the group leader was one of the Rwandan women who expressed a clear dislike of the products, and that this affected the reaction of the Congolese women, or if it was because the participants were from a different ethnic group than in the first FGDs. More research is therefore needed to clarify differences in attitudes towards eating insects between the different ethnic groups among both host communities and refugees. But at least among some groups, the discussions showed, that there is a clear interest in consumption and production of various types of insects, including mealworm.

Potential markets for edible insect products

While it seems most obvious to compare mealworm to other species of edible insects, in reality they may be better compared with another animal commonly consumed in the area by both host community and refugees: silverfish, small fish known as 'Mukene' in Uganda, are commonly consumed as a part of meals, either whole or ground into a paste. They are consumed both to add taste, and as an affordable way to add protein and vitamins to the diet.

These small fish are caught in Lake Victoria and other lakes in Uganda, and are sold at local markets for about UGX 6,000 (USD 1.5) per kilo (though the usual amount purchased is a cup, which corresponds to 150-250 grams and cost about UGX 1,000-2,000). Most FGD participants described eating silverfish at least once a week, and some described eating it almost every day, although not everybody can afford this.



Refugees tasting mealworm and local Nsenene deepfried grasshoppers in Kyaka II



There is a thriving market economy in Kyaka II settlement. Silverfish (to the right), known as Mukene, is a popular affordable way to add protein and vitamins to the diet and are sold in large quantities in the settlement.

Since mealworm hold many of the same properties as silver fish, in terms of size and nutritional value, as well as the way they can be used as part of the cooking, rather than as a snack, it is possible that mealworm could capture part of the market for silverfish, if they can be produced at a competitive price.

Besides human consumption, there is potential for using mealworm produce for feed in poultry production and fish farming. There is no industrial poultry production in the immediate vicinity of the settlement, but some people keep free range poultry, and silverfish are sometimes used as a part of their feed. Similarly, there are NGO-supported fish farms, including by DRC, and DRC purchases and provides the feed to refugees. DRC is also looking at beginning to support poultry farming. Mealworm could therefore also provide an alternative feed source for NGOs supporting refugees and host community members engaged in poultry production or fish farming.

Available feed for insect production

Identification of the most suitable feed for insect production will require further research and experimentation. However, Kyaka II settlement is in a very fertile part of Uganda, and there is extensive production of many types of produce, in particular maize and banana, but also beans, cassava, yam, groundnuts, potatoes, sweet potatoes, passion fruit, papaya, pineapple, cabbage, onions, tomatoes, pumpkins, avocados, mangos and others. There are therefore many potential options for feed.

There is large scale maize production taking place in the settlement, and when the harvest is good, the local price of maize becomes very low. It is therefore possible, that it would make economic sense to convert some of this cheap maize into mealworm-protein. The remains from the maize harvest is fed to chickens and the leaves and stalks are used to cover the ground beneath banana trees. It is therefore also possible that some of this maize stover can be utilised as feed for mealworm. Focus group participants suggested that certain weeds, as well as leaves and/or stems from maize, banana, cassava, beans and millet could potentially be used as feed.



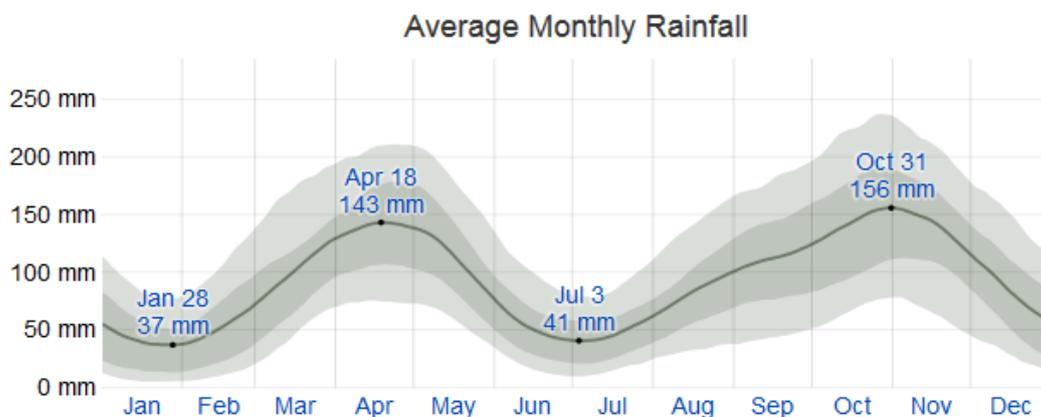
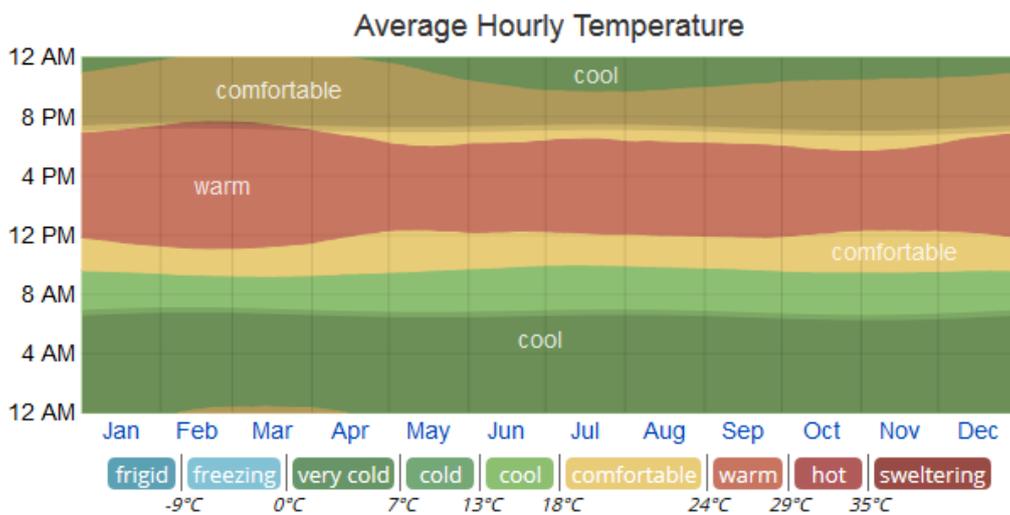
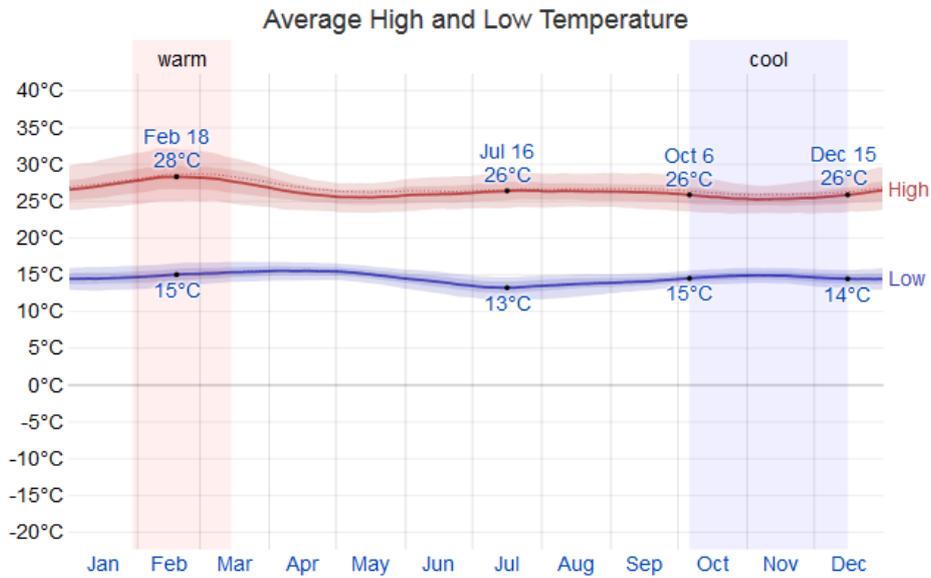
There is a large production of maize in Kyaka II settlement, as well as many other types of produce which may be a source of feed for production of edible insects.

Production

Mealworm production does not require advanced equipment, and refugees would be able to construct their own production kits. However, there is not easy access to the wood required, and the materials would therefore have to be provided to them. It is possible that small-scale production for own consumption could happen inside people's houses, but for larger scale production there is a need to explore different options for constructing farm shelters or buildings, which can keep out rain and ensure the right temperature.

Kyaka II settlement lies at an elevation of on average 1400 metres, located in a valley with significant rainfall, even during the driest months. While average day time temperatures are in the mid-to-high 20's, night-time

temperatures are only on average 13-15 degrees Celsius, something which needs to be taken into account when designing production kits for mealworm production.¹



¹ Source of weather graphs: <https://weatherspark.com/y/96873/Average-Weather-in-Kyegegwa-Uganda-Year-Round>

Existing community structures

DRC has been supporting farmers' associations in Kyaka II settlement for several years. A total of 50 groups with 625 members have been supported. These vary in size from 15 to more than 100 members. Some have official registrations, while others do not. Members of the association often farm various crops and vegetables on common land, while they also have their own individual small plots. Some of the farmers' associations were started as Savings and Loans Associations, and in some cases, the profits from the sale of the common produce is used to provide cheap loans to members. DRC provides seeds and advice through extension workers for the farmers' associations that they work with. In addition, DRC has supported a Farmer's SACCO in the settlement.

Conclusions

There is interest in starting production of mealworm among both host community and refugees, and potential sources of feed and markets for the products can be identified. It is therefore recommended that we move ahead with testing of production kits, in order to answer some of the remaining questions through experimentation.

The next step will be training of host community and refugee members of farmers' associations who are interested in trying production. In addition, staff from the DRC livelihoods team, including refugees employed as extension workers, should participate in the training, in order to be able to provide monitoring and support to the farmers. Materials for the kits need to be provided so construction can take place as part of the training. All training materials should be translated into the main languages spoken by host communities and refugees, in particular Kiswahili, which is understood by most of the Congolese.