

“Piggery and poultry market roadmap for sustainable value chain development”

Identifying opportunities in the Ugandan poultry and piggery sectors

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Ministry of Foreign Affairs



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Executive summary

Poultry and Piggery in Uganda

The poultry and piggery sectors in Uganda are both rapidly growing sectors that provide interesting opportunities for the Dutch Private sector, investors and education institutes. **The Dutch private sector is showing a high interest in these sectors, especially poultry, and its future development.**

Both chicken meat, eggs and pork meat are popular proteins, whose consumption is benefiting from an increasing consumer demand for ready to eat products. However, there is still a limited demand for quality products. The overall development of a strong home market would significantly contribute to a more resilient value chain.

Challenges for private sector development

- The poultry and piggery sectors in Uganda, although having common features, are in significantly different stages of development. Where piggery is still in a rudimentary stage of development, the poultry sector is advancing to a more professional value chain.
- There are number of large players in poultry whose production processes and methods are at near European standards. **Overall, poultry production is estimated to be significantly higher in the country than official figures indicate.** The increasing scale of the main players and the associated economic advantages of scale are skewing the playing field against smaller and mid-sized players, preventing them from further growing their business or pushing them out of the market. **This is more pronounced in the broiler segment than in the layer segment. In the layer sector, a segment of rapidly growing middle-size farmers has been identified.**
- However, in order to not be outcompeted by the large integrated players, **middle-size farmers will have to intensify their production and adopt modern technologies.**
- The pig value chain is characterized by many (poor-quality) breeders and a limited number of commercial pig fatteners or slaughterhouses. Traders wield high market power, lowering market prices and profitability for farmers. **Key interventions to spur growth are investments in slaughtering facilities coupled with awareness creation of the benefits of quality pork meat among pork joints owners and farmers.**
- There are currently no vocational education institutes offering programs specifically geared towards small livestock. **In all parts of the value chain, professionalization of standards will be key towards development of the sector.**

- Both sectors are highly influenced by the fluctuations in maize prices, which is the primary component of feed. **This leads to over- and under-supply throughout the year, disrupting effective capacity usage in all segments of the value chain.** Increased foreign demand for soy is driving a shortage of available protein for feed input.
- Lastly, there are limited knowledge and education resources available for farmers. Most farmers receive their information from other farmers instead of formal resources, leading to the replication of poor practices throughout the sector. **This affects the productivity of farmers in all segments, but also contributes to poor agricultural practices and feed use.**

Interventions and opportunities

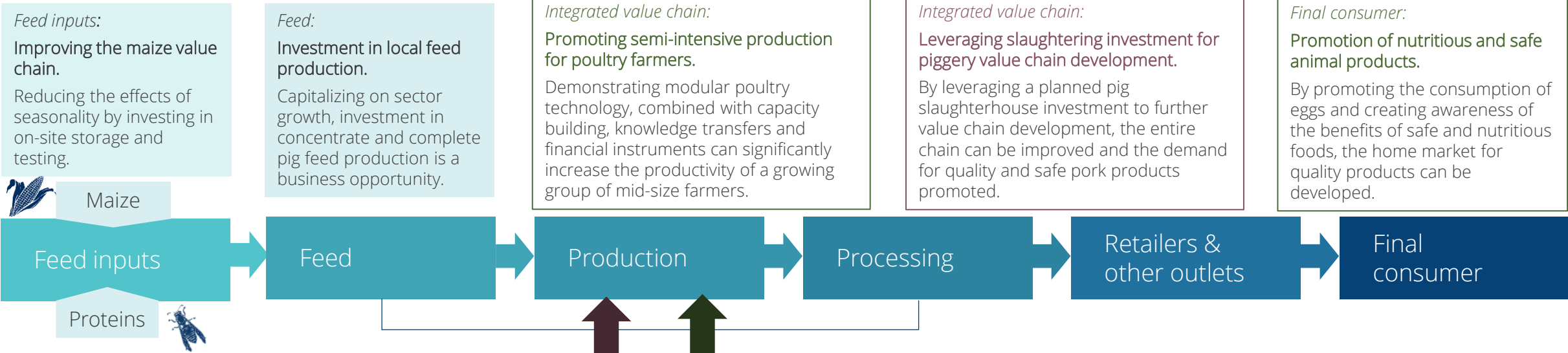
- In response to these challenges **ten comprehensive interventions** have been identified. These present opportunities for the Dutch private sector to contribute their expertise. A number of these interventions span the entire value chain and require a level of financial support not solely available using RVO instruments. However, these have been included to allow for other interested parties to potentially implement the proposed interventions. In this way, other actors are invited to develop the poultry and piggery value chains, leading to higher productivity, income, and sustainable growth.
 1. Improving the maize value chain;
 2. Improving vocational livestock education;
 3. Increasing production of alternative proteins for feed;
 4. Improving locally available poultry genetics;
 5. Investment in local feed production;
 6. Promoting semi-intensive production for poultry farmers;
 7. Leveraging slaughtering investment for piggery value chain development;
 8. Promotion of nutritious and safe poultry products;
 9. Improving locally available piggery genetics;
 10. Key regulatory reform.

Executive summary

Market roadmap for sustainable value chain development

Framework conditions:
Key regulatory reform.
A number of key regulatory reforms that can significantly boost sector development have been identified.

Regulatory reform



Education



Impact of COVID-19

Drastic changes in the market

- Most of the primary data collected in this study has been collected prior to the imposed lockdown in Uganda (February 2020). As a result of the strict lockdown imposed in Uganda, market conditions have changed. Within Eastern-Africa, normally a fast growing region, the World Bank expects an economic shrink of 5,1%.
- In Uganda, during the lockdown all non-essential business had to shutdown, public and private transport was banned and a dusk to dawn curfew was installed.
- As of yet, none of the major players in the sectors have stopped operating. However, market prices did lower significantly.
- Players in the market have had to lower their prices due to decreased demand. Prices of Day Old Chicks of one of the major suppliers, SR Afro, lowered from 2100 UGX/Chick in January 2020 to 1800 UGX/DOC at the end of March. Similarly, prices for a kg of processed chicken from UgaChick lowered from 17,000 UGX/kg pre-lockdown to 16,000 UGX/kg in May.
- As well, the poultry sector is facing a major challenge in importing DOCs and breeding stock into the country. Due to logistical challenges, these imports have not been or only limitedly possible. Several farmers have been unable to stock their houses with birds, incurring major losses.
- The difficulties in bringing in genetic material has been mentioned by the President of Uganda in a speech, who emphasized the fragility of international supply chains and the importance of local production. Regional or local value chain development is essential for a resilient food system.
- A number of the recommendations made at the end of report, most notably those focussing on local production and closing of local value chains, are thus extra relevant given recent developments. Local investment in poultry genetics and DOC production, further investments in local feed manufacturing and improving the local input value chains for feed production should be prioritized when taking the impact of COVID-19 into account..

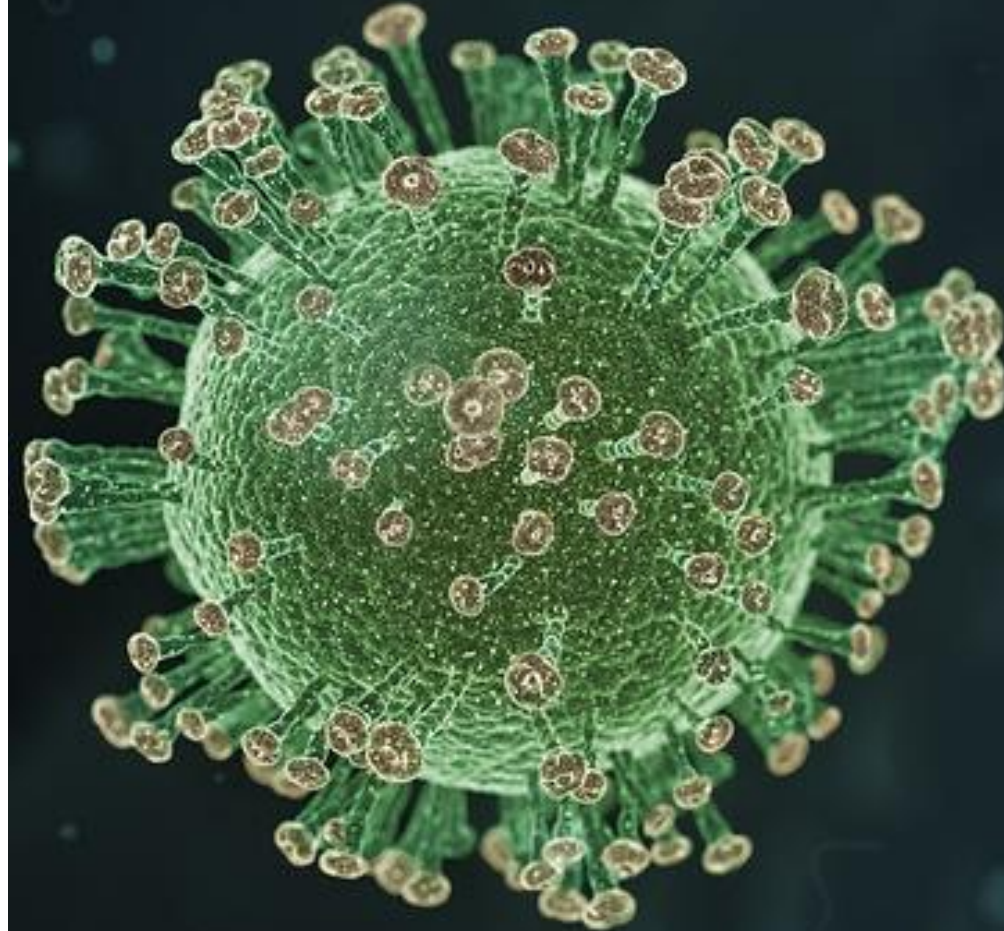


Photo by Yuri Samoilov, <https://flic.kr/p/2iFZkM4>

Introduction

Background

The Republic of Uganda is a rapidly developing country in East-Africa, experiencing a fast population growth and increasing incomes. The Ugandan population is projected to reach 100 MN in 2050, with 60% of the increase taking place in urban areas. According to the World Bank, economic growth remains strong, with an estimated growth rate of 6.3% in 2019, largely driven by service and industrial growth. However, the agricultural and livestock sector remains the backbone of the economy.

Up to 70% of Ugandan households fully or partially derive their income from livestock. The pork and poultry sectors are paramount in providing Ugandans with proteins and food security. In recent years, pork consumption has reportedly increased significantly in the country, with it now being estimated to be the second most consumed protein product in the country. Similarly, consumption of poultry products is increasing, with an increasing demand for poultry cuts and other value-added products. This is especially true among the rapidly increasing urban population of Kampala. In order to meet the growing demand, the piggery and poultry farms in and around peri-urban and urban areas require to undergo rapid growth and transformation.

Moreover, the recent efforts from the Ugandan government to increase market access through investments in roads and the designation of nine municipalities as regional cities is expected to increase rural development. Rural demand for egg-based convenience products is driving a rural increase in demand. It can therefore be expected that the Ugandan food supply will become increasingly dependent on pork and poultry products, leading to expanding business opportunities.

However, until date, the poultry and the pig sectors have not yet developed to their potential. Although both sectors are different in their level of development, both are facing similar limitations including a high degree of information asymmetry in the market, seasonal input shortages, limited agro-processing facilities, lack of farmer utilization of quality feeds, limited quality genetic material, limited knowledge on nutrition, fake veterinary inputs and limited rural extension services, improper farm management and low institutional support.



Introduction

Contribution of the Netherlands

The Netherlands is renowned for efficient production of poultry and pork products. Its policies and practices applied are regarded as international standards. The Dutch sector (knowledge institutes, government agencies and private sector) is currently the preferred partner of many poultry and piggery stakeholders in the country, having a clearly established presence in the country in both sectors.

Dutch expertise and technological solutions can positively contribute to overcoming the limitations in both sectors and spur productivity and sustainability in the sector. To guide such collaboration and investment, a roadmap for increased private sector engagement is proposed in this study. This roadmap outlines the current bottlenecks and trends and describes concrete interventions that would spur sector growth. These interventions are geared towards stimulating the private sector, public stakeholders and development partners to engage in the development of this sector.

For this purpose, the Embassy of the Kingdom of the Netherlands in Kampala (hereinafter referred to as “EKN”) and the Netherlands Enterprise Agency engaged Larive International and Lattice Consulting to develop such a roadmap. This roadmap aligns well with the objectives of the EKN, which aims to support Uganda’s private sector development, support food security and promote Dutch business interests in the country.

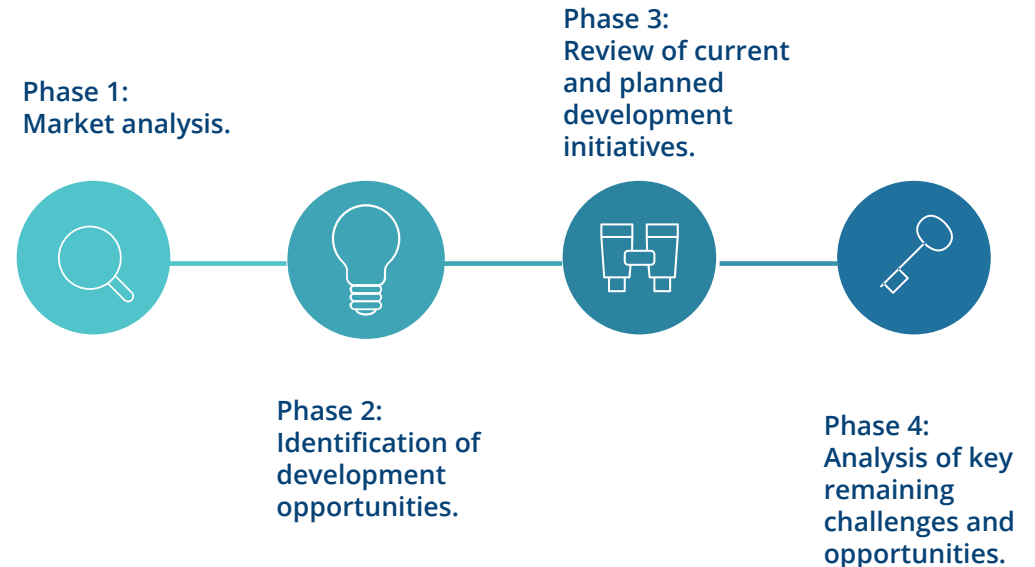
At current, there are no Dutch government-funded activities on poultry or piggery in Uganda. However, as the Netherlands is gradually transitioning from bilateral aid towards to a broader, mutually benefiting, political, and economic and trade relationship, this roadmap should pave the way for Dutch companies and knowledge institutes, enabling them to engage in the Ugandan market.

Structure of the report

This report first provides an in-depth general context and market analysis. It highlights trends, the key players and the overall regulatory framework.

Based on this analysis, a SWOT analysis of both sectors and the Dutch involvement has been provided and development opportunities have been identified.

Finally, this report provides an overview of the current and planned development initiatives and key recommendations for remaining interventions.



Research methodology

Research approach

This research had a three-pronged approach.

1. First, using secondary research, essential statistics, information and data about the poultry and piggery sectors in Uganda was collected. This desk research included the review of existing (academic) studies on poultry and piggery in Uganda, gathering relevant statistics, mapping key public & private stakeholders, and understanding policies and regulations that apply to the poultry and piggery market in Uganda.
2. Second, primary research was conducted by interviewing both Dutch and Ugandan stakeholders. Through this process, market information was collected and validated and main opportunities and challenges were identified. In total, 12 Dutch stakeholders and 62 Ugandan stakeholders were interviewed for this study. Ugandan stakeholder interviews were primarily carried out by two Ugandan expert consultants. An overview of the interviewees is included in Annex 1.
3. Third, the information collected in this study was peer reviewed by Dutch and Ugandan sector experts to ensure validity of the included information and the key recommendations.



SWOT Analysis

Ugandan market - general

Strength

- A growing market for animal proteins due to increasing population and higher incomes.
- Changing consumption patterns towards quality and convenience products.
- High domestic production of maize, a key ingredient to animal feeds.
- Growing awareness and interest in improved technologies by farmers.

Weakness

- Relatively low knowledge level, especially on nutrition and disease management.
- Lack of practical education in livestock.
- Limited trained staff available on the job market.
- High costs of lending for farmers.
- Limited rural veterinary extension services.
- Lack of (independent) testing facilities for feed and veterinary supplies.
- Lack of proper animal health practices on farm.
- Lack of product standards and enforcement of slaughter regulations.

Opportunity

- Great potential to become a strong export market due to relatively low costs of production.
- **Increasing rural demand.**
- Increased demand for value added goods.
- Improvements in waste management practices can greatly benefit the sector.
- **Sector growth allows for local feed production.**

Threat

- Seasonality of production and input prices.
- Political border instability.
- **High animal disease prevalence.**
- Both sectors not a government priority.
- Competition from increased aquaculture production as a form of animal protein.

Observations

Uganda's economy is rapidly developing, with a growing consumer class of many single households. This is increasing the demand for convenience food products. This provides opportunity for value-addition in the value chain.

Both the poultry and piggery production in the country is growing. One of the key bottlenecks for further industry development is the current quality of local feed. However, given the high domestic production of maize, Uganda has the potential to be a regional leader in feed production.

The biggest weakness in both sectors is limited knowledge in all segments of the value chain, leading to inefficiencies and reduced margins. Poor biosecurity standards lead to a high prevalence of animal disease.

Whilst both sectors are increasingly professionalizing, there are a number of opportunities for the Dutch private sector to engage and contribute.

SWOT Analysis

Ugandan Poultry market

Strength

- A growing market for animal proteins due to increasing population and higher incomes.
- **Changing consumption patterns towards quality and convenience products.**
- Number of strong private sectors players already presents.
- High domestic production of maize.
- Growing awareness and interest in improved technologies by farmers.
- Already **a high level of Dutch involvement** in the sector.

Opportunity

- Great potential to become a strong export market due to relatively low costs of production.
- Increasing rural demand.
- Increased egg consumption.
- **Increased demand for value added goods.**
- Improvements in waste management practices can greatly benefit the sector.
- **Sector growth allows for local feed production.**

Weakness

- Relatively low knowledge level, especially on nutrition and disease management.
- Lack of practical education in livestock.
- Lack of trained staff on the job market.
- **High costs of lending for farmers.**
- Lack of rural veterinary extension services.
- Lack of (independent) testing facilities for feed and veterinary supplies.
- Lack of proper animal health practices on farm.
- Lack of product standards and enforcement of slaughter regulations.

Threat

- Seasonality of production.
- Imports of meat.
- Political border instability.
- High animal disease prevalence.
- **Dominance of few large private sector players.**
- Poultry is not a government priority area.

Observations

The poultry market in Uganda has been developing at a fast pace, partly due to changing consumer behavior and the presence of fast food chains. These types of outlets need to adhere to international standards and in turn are a driving force for value chain development.

While farmers often have the ambition to invest, they are held back by a lack of accessible finance. In the sector, only a few players have the capital to invest.

This dominance of the largest players in the sector is the biggest challenge for resilient development of the value chain. These market dynamics stifle competition resulting from a diversified playing field and prevent smaller players from being able to compete.

These smaller players will have to invest in order to be able to compete. Moreover, a stronger domestic market will be needed for overall long-term sustainability of the sector.

SWOT Analysis

Ugandan Piggery market

Strength

- A growing market for animal proteins due to increasing population and higher incomes.
- Changing consumption patterns towards quality and convenience products of growing middle class.
- High domestic production of maize.
- **Growing awareness and interest in improved technologies by farmers.**

Weakness

- Relatively low knowledge level, especially on disease and farm management.
- Limited practical education in livestock or trained farmers.
- Limited rural veterinary and artificial insemination extension services.
- Limited applied biosecurity on farms.
- Lack of quality standards and enforced slaughter regulations.
- Limited specialized pig feed in the market.
- Underdeveloped market for quality pork meat.
- Mostly practiced as non-commercial farming.
- **Limited local slaughtering facilities.**
- Transport of pigs is not allowed by night

Observations

The Ugandan piggery sector is still very rudimentary in its development. Therefore, while many of the challenges seem like those in poultry, in piggery these challenges are more constraining. The biggest weakness in the piggery sector is the limited local slaughtering capacity which prevents farmers from growing their business.

After the market stagnated a couple of years ago, some strong players have emerged and are willing to invest in improved technologies. A number of commercial players is emerging.

This growth certainly can be leveraged for private sector development and pose as a great opportunity. One of these includes the establishment of national breeders register to ensure quality products on the market.

One of the threats currently faced in the market is the market power held by traders. This prevents farmers from obtaining fair prices and limits their ability to grow their business.

Opportunity

- Great potential to become a strong export market due to relatively low costs of production.
- Increasing rural demand.
- Increasing demand for value added goods.
- Improvements in waste management practices can greatly benefit the sector.
- **Sector growth allows for local feed production.**
- **Genetics/breeding certification or registration.**

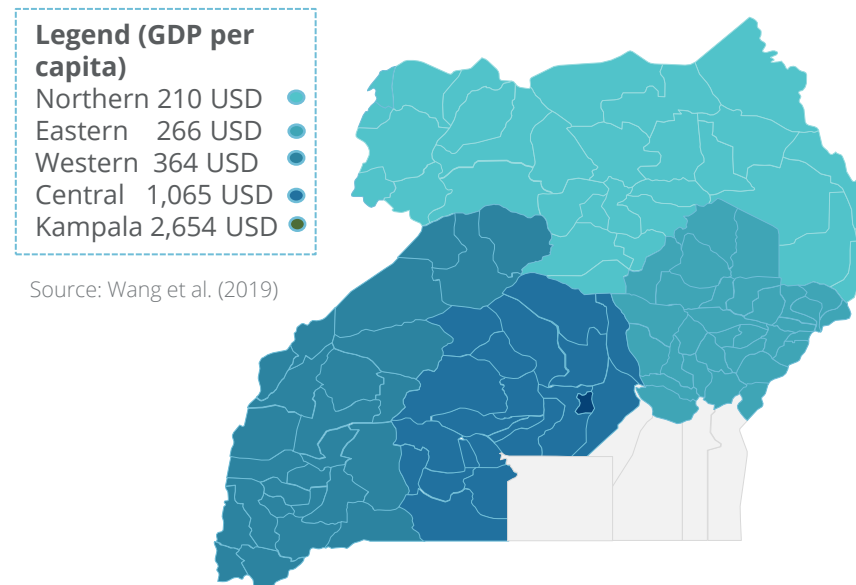
Threat

- Seasonality in input prices.
- High reliance on domestic market.
- High animal disease prevalence, especially African Swine Fever.
- Piggery is not a government priority area.
- **Traders have excessive market power, leading to low farmer profitability.**
- Market flooded with low-quality or free piglets.

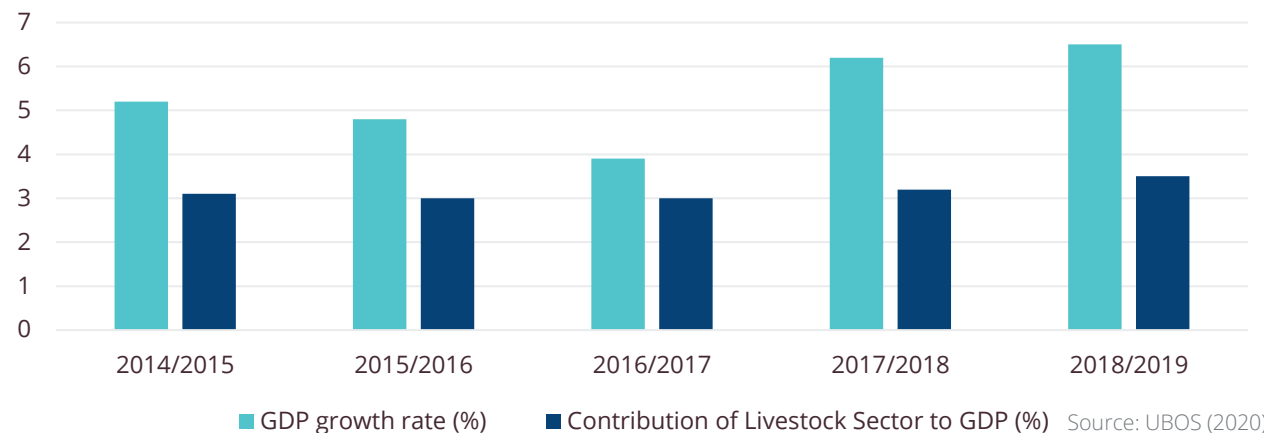
Uganda overview

A rapidly growing country with a limited contribution of livestock to GDP

- The Ugandan population has been growing at a rate of around **3%** for the last decades. As a result, its population has increased from 24 million people in the year 2000 to **42 million people now**. The population is expected to increase to a **100 million people in 2050**. This population growth is even more rapid in the cities, with an **annual urban growth rate of 5.2%**.
- The country is especially young. **48%** of the country is below the age of 15, with around 1 million people entering the job market each year.
- The GDP per capita in the country is 642 USD, which grew by **6.5%** in 2018 and 6.2% in 2017. This growth and economic activity is not equally divided across the country. As illustrated in figure 1, the Northern and Eastern regions are especially poor.
- Agriculture is a key sector in Uganda, accounting for **21.9%** of the total GDP and **64,3%** of the employment in 2019 according to UBOS. However, the livestock sector only accounts for a small contribution of **3%** to the overall GDP, which has remained stable over the years.
- Livestock does play a key role in subsistence farming and food production in the country. 2.6 million households in the country have one or more chickens, which is **40%** of all households. Both pigs and chickens serve as a form of insurance, providing a source of income and meat in difficult times.



GDP growth and contribution of livestock to GDP

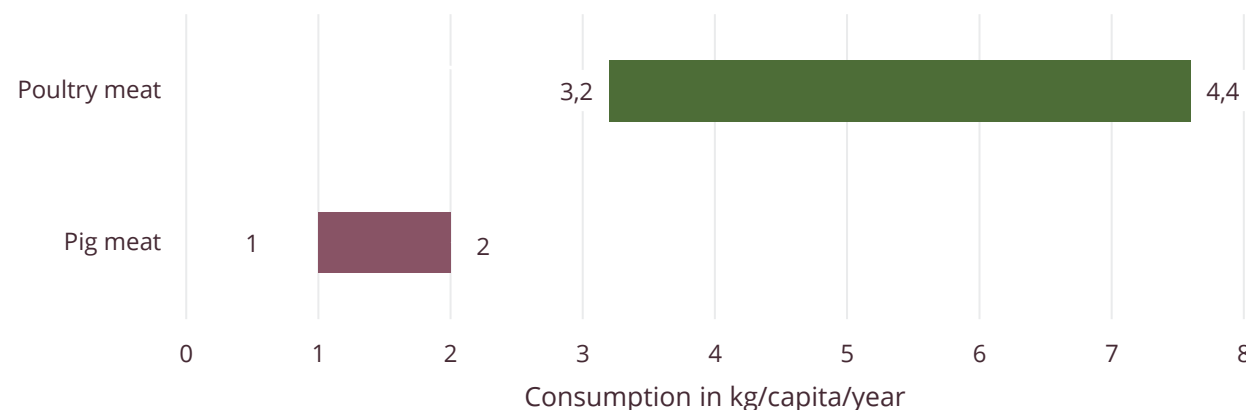


Consumption of pork and poultry

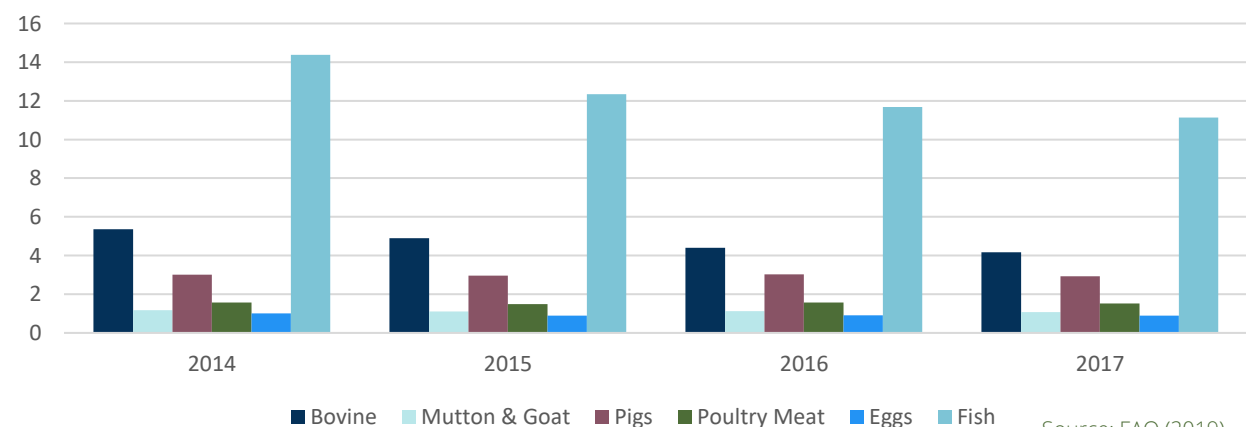
Popular consumption and higher value products demanded

- Both chicken products and pork meat are very popular protein products in Uganda. Both are profiting from an increasing trend in consumer demand for ready to eat products.
- Pork is primarily sold through so-called pork joints, roadside pork restaurants that sell different preparations of pork. **70%** of all pork is estimated to be sold through this channel.
- An increased consumption of eggs has been driven by the popularity of Rolex chapatis, an egg rolled in a form of flatbread with vegetables. Being a cheap and easy to prepare product, it is becoming increasingly popular in rural areas.
- Based on the official figures of the UBOS, the FAO estimates per capita available food supply per year to be at **1.52 kg of poultry meat, 2.93 of pig meat and 0.88 kg of eggs in 2017**. A recent study carried out by the FAO estimates the per capita consumption of poultry meat to be as low as **0.8 kg/capita/year in 2019**. These figures are very likely to be unreliable, as government officials interviewed in this study indicate that they lack the information capturing mechanism to properly to estimate this data.
- Based on the primary production data from this study, we estimates per capita food supply of pig meat to be in the range of **1 to 2 kg/capita/year** and a food supply of poultry meat to be in the range of **3.2- 4.4 kg/capita/year**.
- Based on the primary production data from this study, we estimate a total production of between **77 and 135 eggs per capita in the country**. However, a significant proportion of this production is informally exported, with large players indicating the export of **60% of their produced eggs**.

Study estimates of food supply quantity (kg/capita/yr)



FAO estimates of food supply quantity (kg/capita/yr)

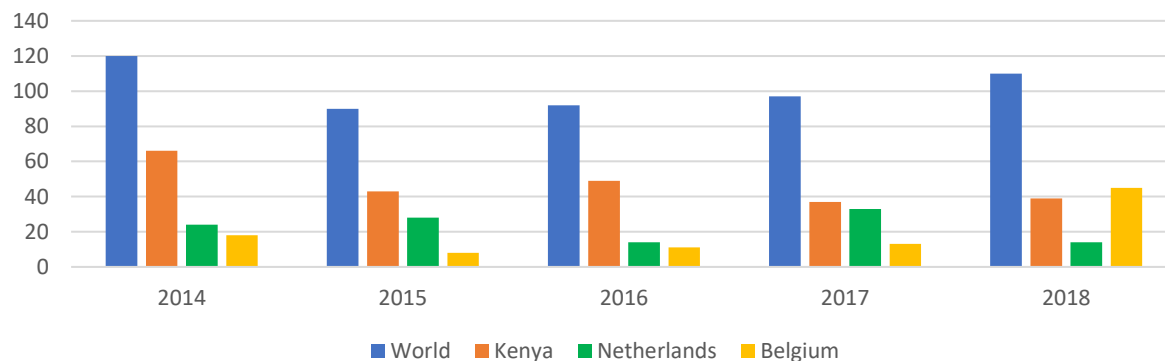


International trade –genetic material

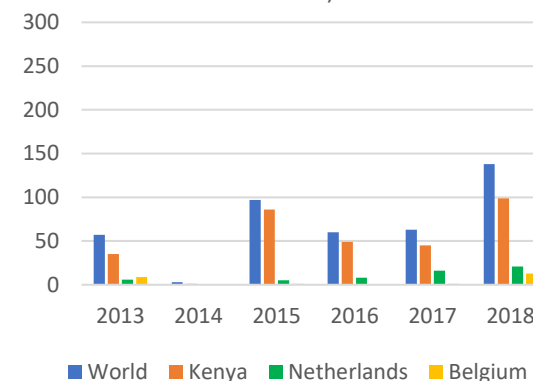
Underreporting of regional trade and significant trade in genetic material

- Uganda **exports** Day Old Chicks (“DOCs”) to neighbouring countries such as Rwanda and Kenya. However, **frequent restrictions on regional trade in poultry products make it difficult to build an export oriented business**. Examples of such restrictions are, a two-year ban on Ugandan products by Kenya that was lifted only last year and Tanzania currently banning DOC imports.
- Foreign players such as KenChick or Uzima are **increasingly present** on the Ugandan market. Dutch **hatcheries directly export** primarily layer DOCs and layer breeding stock to Uganda.
- There are **currently no grand parent farms (GPS)** in Uganda, necessitating the major players to import their parent stock. Regionally, Zambia is a major exporter of parent stock chicks. However, Uganda primarily imports their parent stock from Belgium or the Netherlands.
- Denmark currently has position as the preferred partner for pig genetics. There is one licensed Danish genetics distributor active in the country and the NAGCR&DB is looking to source new breeding stock from Denmark together with a number of private parties. Dutch pig genetics companies also have a strong presence in Uganda. Their breeding animals are mainly exported from affiliates/local offices in South Africa.

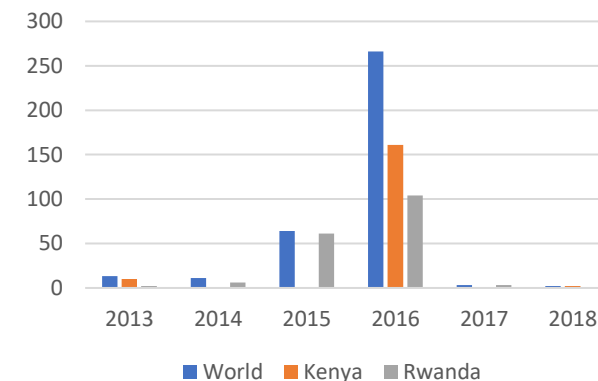
Official **imports** of live chicken with weight of >185 gram (metric tonnes)



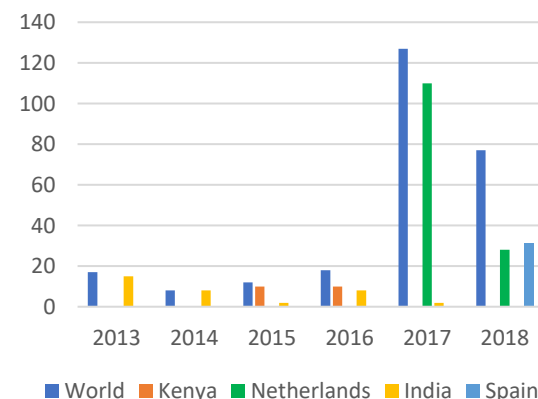
Official **imports** of live chicken with weight of <185 grams (DOC) (metric tonnes)



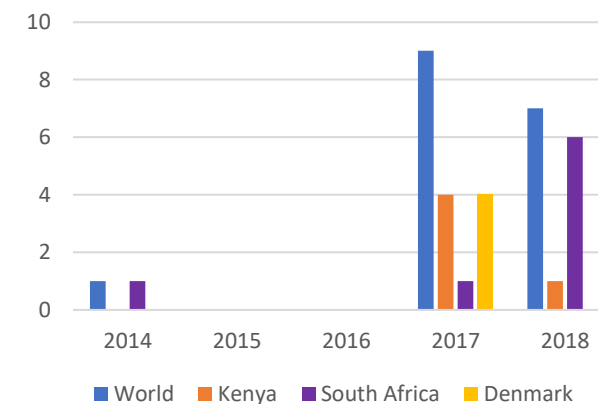
Official **exports** of live chicken with weight of <185 grams (DOC) (metric tonnes)



Official **imports** of fertilized eggs for incubation (metric tonnes)



Import of pure-bred swine for breeding purposes (metric tonnes)

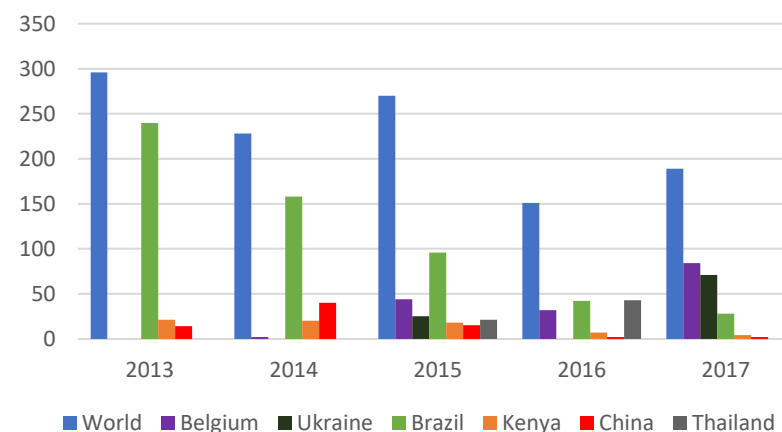


International trade – meat and eggs

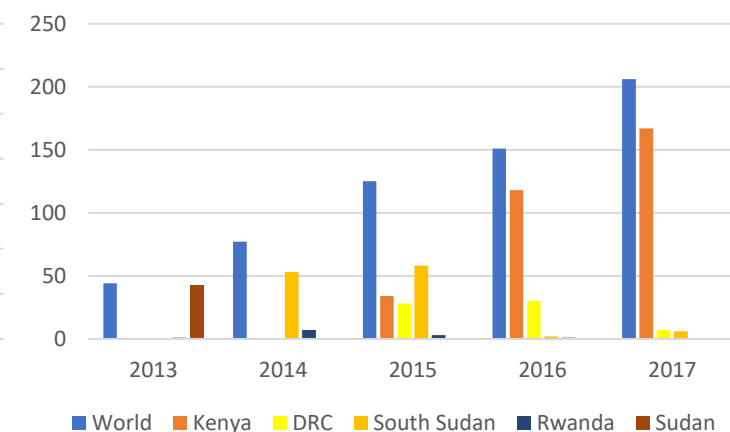
Significant informal cross-border trade and new restrictions on meat imports

- Imports of eggs in Uganda are negligible, whereas **much of the export is informal** and therefore not included in these figures. Traders indicated **that live animals are exported easier as processed meat products incur informal import levies.**
- Traders from Kenya operate in Nairobi and buy pig carcasses and poultry meat from Uganda. Some of the larger poultry players also export directly to Kenya or Tanzania. Farmers near the borders indicate that they sell cross-border, **with South-Sudan being an upcoming and interesting market.**
- The government of Uganda imposed a **60% import duty on meat in 2018**. It also imposed a 25% levy on Kenyan poultry products.

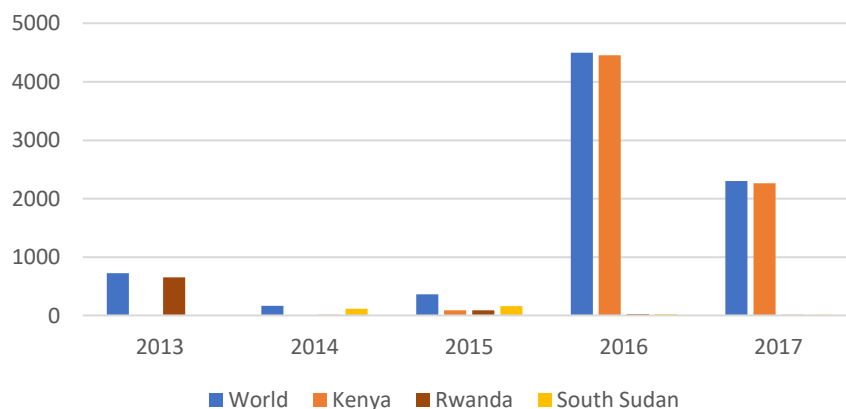
Official poultry meat imports (metric tonnes)



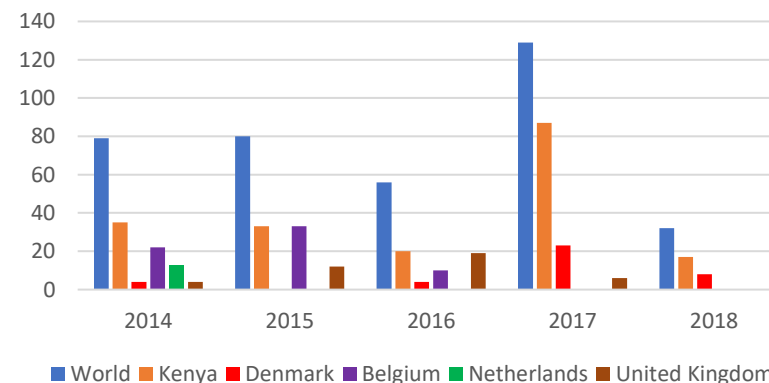
Official poultry meat exports (metric tonnes)



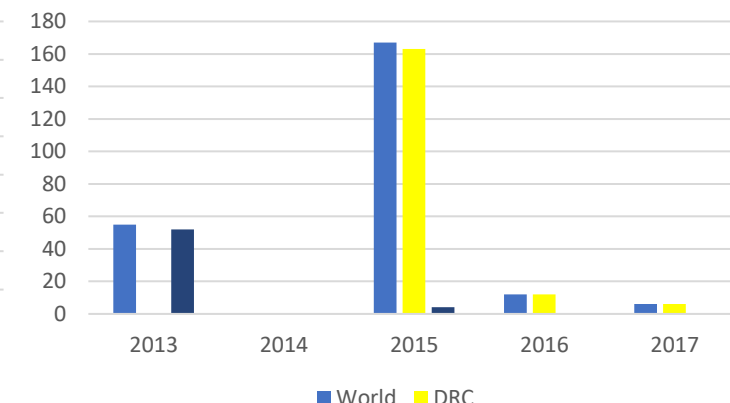
Official egg exports (metric tonnes)



Official pig meat imports (metric tonnes)



Official pig meat exports (metric tonnes)



Institutional, legal and regulatory framework

Legal framework – Tariffs, VAT and import duties

Import and export duties

Import Duties Specified goods

- Most goods necessary for poultry and piggery farming are exempted from all taxes when imported by a person engaged in agriculture under the 5th schedule of the East African Community Customs Management Act, 2004. This includes feeds and feed premixes, DOCs, breeding animals, poultry parent stock, slaughtering equipment and poultry incubators. A full list of import duties of the main poultry and piggery related products is provided in Annex 1.

Import duties Non-specified goods

- Three tier system for imports from outside the EAC:
 - 25% import levy on finished products;
 - 10% import levy on intermediate products;
 - 0% on raw materials (excluding foodstuffs). Most foodstuffs such as maize are taxed at a higher rate.
- VAT of 18% on goods from outside the EAC.
- A withholding tax of 15% on goods from outside the EAC.
- Imports are subject to a 1.5% infrastructure tax.
- Imports of poultry and pig meat is taxed at 60%.

Exemptions

- VAT-exemption is granted for supply of machinery, tools and implements suitable for use only in agriculture.
- VAT-exemption and exemption from withholding tax is granted on agricultural supplies like animal feeds and premixes.
- VAT-exemption is granted for exported products.
- VAT-exemption is granted for livestock, unprocessed foodstuffs and unprocessed agricultural products, except wheat grain.
- Import of plant and machinery:
 - Import duty is NIL by tariff; VAT is deferred and withholding tax is 6% as long as the cost of plant and machinery is above US \$ 22,500. It is required to apply to the Commissioner Trade Customs for the facility in writing and must be registered for VAT.

Regulatory framework

Both sectors are not a government priority

- Both poultry and piggery are not government priorities and therefore **receive limited support from the Ugandan government**. Support is given primarily through the National Agriculture Advisory Services (NAADS), a governmental extension agency, which occasionally provides inputs to farmers under Operation Wealth Creation.
- Under the ASSP, which is to expire this year, piggery and poultry meat were part of the 12 key commodities. However, as they were assessed to have limited export potential, **they have not been included in the 9 priority commodities in the new National Development Plan III**. This latter plan primarily focusses on agro-processing as a key development priority.
- Although there are a number of policies and acts governing these subsectors, such as the Public Health Act, the Animal Diseases act, the Meat Policy and the Animal Breeding act, these are not widely enforced due to the informal nature of most of the subsectors. The major slaughterhouses must adhere to the Ugandan National Bureau of Standards for their products to be accepted in the major supermarkets.
- A new bill, that is likely to impact the subsectors, has been put to parliament last September called the **“the Veterinary Drugs and Feeds bill”**. This bill is aimed at **combating the presence of fake vaccines and poor-quality feeds on the market**, issues that were both mentioned as critical by stakeholders. **If** enacted and successfully enforced, it could be a major boost for the subsectors.
- The effects of the enactment of this bill on the import of vaccines, feed, premixes or concentrates is not yet clear. **At the moment, stakeholders face difficulties in importing these agricultural inputs. It can take up to two months to import these inputs, a real constraint given the limited shelf life of these products**. For example, feed concentrates, or vaccines only stay well for about a year, meaning 1/6th of the shelf life is lost in transit. Moreover, there are real concerns on the storage procedures of the vaccines during this import period, further lowering the quality of veterinary medicine in the country.
- **A key final regulatory constraint is the ban on the transport of live animals during the night**. Pigs cannot be transported during the day, as they cannot handle the heat stress. **As a result, those wishing to transport pigs have to bribe officials in order to allow them to travel by night**. This significantly increases the market power of traders in the value chain and raises the costs of production.



Education and research

Education

Lack of practical, livestock specific education and new initiatives face difficulties in accreditation.

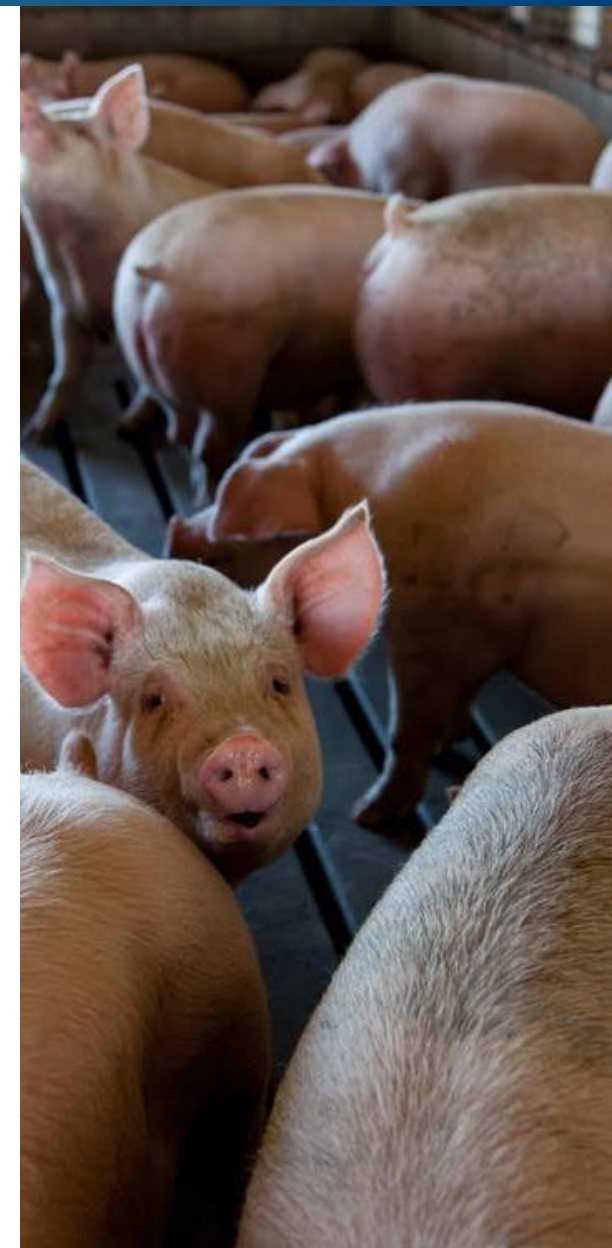
- Uganda counts 56 technical schools, which have vocational training and agricultural programs. There are 36 private universities and 6 public universities, of which **Makarere** is the most well known. Only a few of these institutions offer a livestock and animal science program, but unfortunately these **often do not offer specialization in the fields of poultry or piggery**.
- When assessing the current status of the educational system in Uganda, its structure can best be described as highly traditional. The content of programmes is very broad, with little focus on either poultry or piggery. Poultry, for example, is an additional subject that is part of a larger veterinary education at BSc level. The focus in livestock programs is often geared towards larger animals. This the result of traditional perceptions of livestock, in which especially poultry is seen as a secondary source of income. Therefore there is a clear gap between the offered programs and the required expertise in the field, as companies do have a demand for expertise in poultry and piggery on all educational levels. Due to the lack of focus, topics such as **nutrition and disease management are not adequately covered**.
- Secondly, **the programs are highly theoretical**. It is therefore difficult for students to use the knowledge they obtained and apply it into the workplace. Universities and farms do have farms for research and practical lessons. **For example, Makerere University has good practical education facilities through support of Korean actors**. However, these farms are often far from the buildings where theory is given. Transport and logistics costs form a key barrier to practical education. **Internships are a limited practice**, although some initiatives are taken to increase the adoption of this learning tool. The students that have participated in internships, for example at the Seeta Institute of Animal Production, are highly sought after in the labour market.
- Amending the structure and including new teaching methods is another aspect that requires a comprehensive approach. It will also require strong collaboration with the two schools that offer teacher programmes. To provide practical education, private educational institutes have been established to integrate practical and theoretical education in the field of animal production. These are modelled after Dutch training institutes such as Aeres and integrate practical education and internships in their programs. The graduates of these institutes are highly sought after by the private sector. **However, difficulties in receiving official accreditation when not following the standard educational curriculum leads to challenges in long term sustainability and viability**.
- Lastly, there are **challenges in keeping the curriculum up to date** with the latest developments. While there certainly are various initiatives launched, there is often little consistency or comprehensive curriculum development. These issues are the result of a highly fragmented playing field, in which educators, administrators, governments and international organizations often find effective collaboration to be difficult to achieve.
- The gap in practical education is currently filled by the private sector. Many **farmers resort to other farmers or input providers for training**. Farmers pay as much as 150,000 UGX for a visit to successful other poultry farms and the major feed companies have taken up the role as educators. They are giving trainings throughout the country, sometimes even using Western trainers. Farmers are also organizing themselves in farmers groups, where farmers in turn visit each others farm to learn and provide feedback on each others' operations.



Research

Research projects are already being carried out, especially by ILRI in the pig value chain.

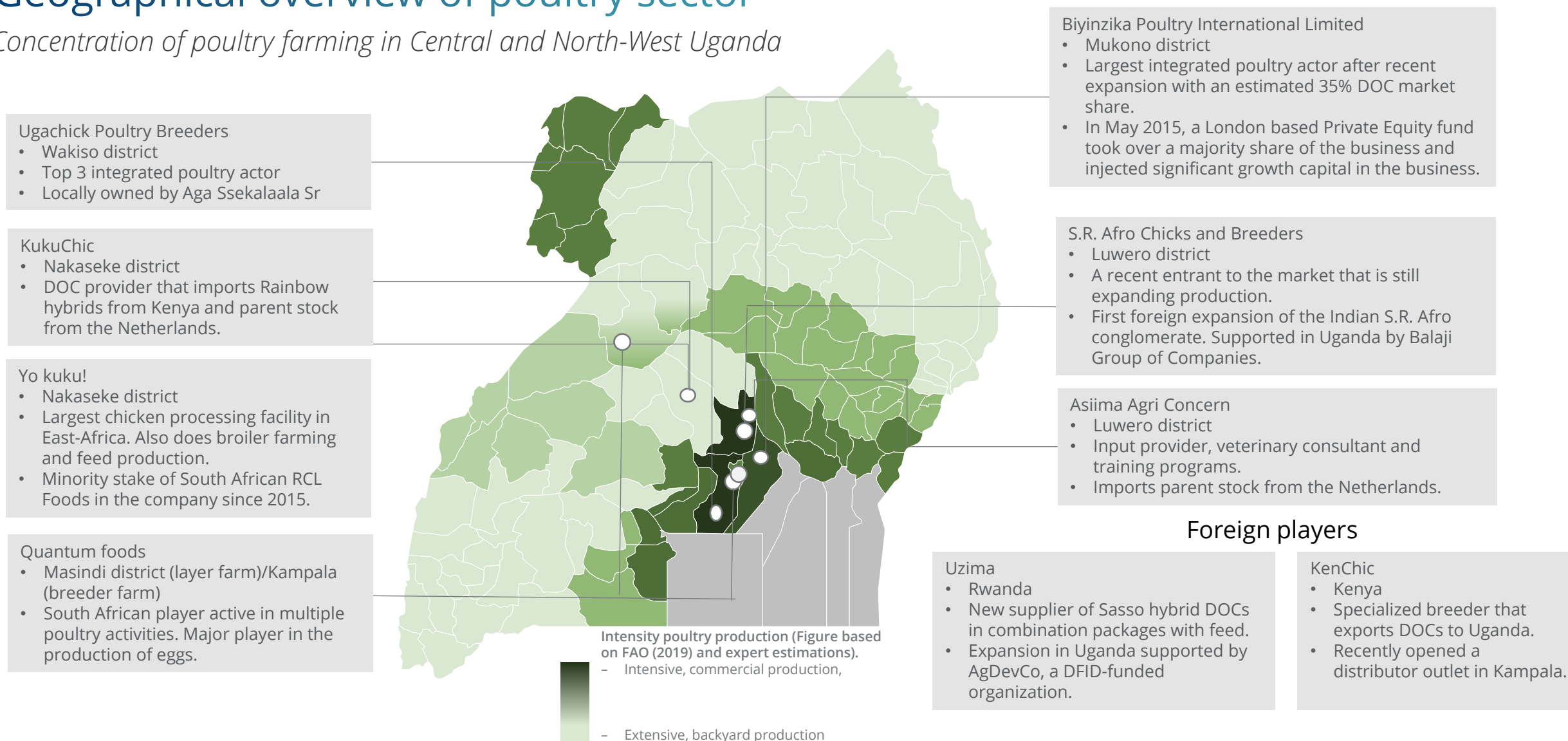
- Research on poultry and piggery in Uganda is **relatively well developed and funded**. There are quite a number of research initiatives taking place in the country, which also adhere to adequate research standards.
- The National Agricultural Research Organisation (NARO) works in many different agricultural fields. The Livestock Nutrition Research Programme is one of the four programmes that constitute the Livestock Resources Research Institute (NaLIRRI) located in Eastern region (Tororo District) of the country. The programme seeks to generate and disseminate technologies and information that directly addresses animal nutritional challenges in the country. During recent times, considerable progress in the area of technology and information generation has been made. Other themes covered by the research include:
 - Livestock breeding and Theriogenology.
 - Development of cost-effective livestock vaccines.
 - Disease diagnostic research.
 - Livestock feed and food safety.
- The International Livestock Research Institute (ILRI) has been, **and still is, conducting research specifically focused on improving pig genetics and the smallholder value chain in Uganda**. Research such as this contributes to understanding the productivity and profitability of the Ugandan smallholder pig enterprises through:
 - The identification of the most appropriate pig breed-type(s).
 - The development of a genetic improvement strategy to ensure the availability and accessibility of genetically superior pigs.
 - Support for the uptake and optimal management of the genetically superior pigs.
- The National Agricultural Genetics Center & Databank (NAGRC & DB) carries out breeding programmes, research and sells genetic material. They have been involved in the introduction of the hybrid Kuroiler chicken in Uganda and are currently looking to import Danish pig genetics.
- **Makerere University is one of the more renowned universities in the entire African continent**. Whilst continuously working on improving their livestock programmes through dedicated research initiatives, the university also has one of the more **advanced facility focused on piggery**. **In collaboration with the South Korean government a piggery and poultry research facilities have been opened**, focused on organic production technology.



Poultry market analysis

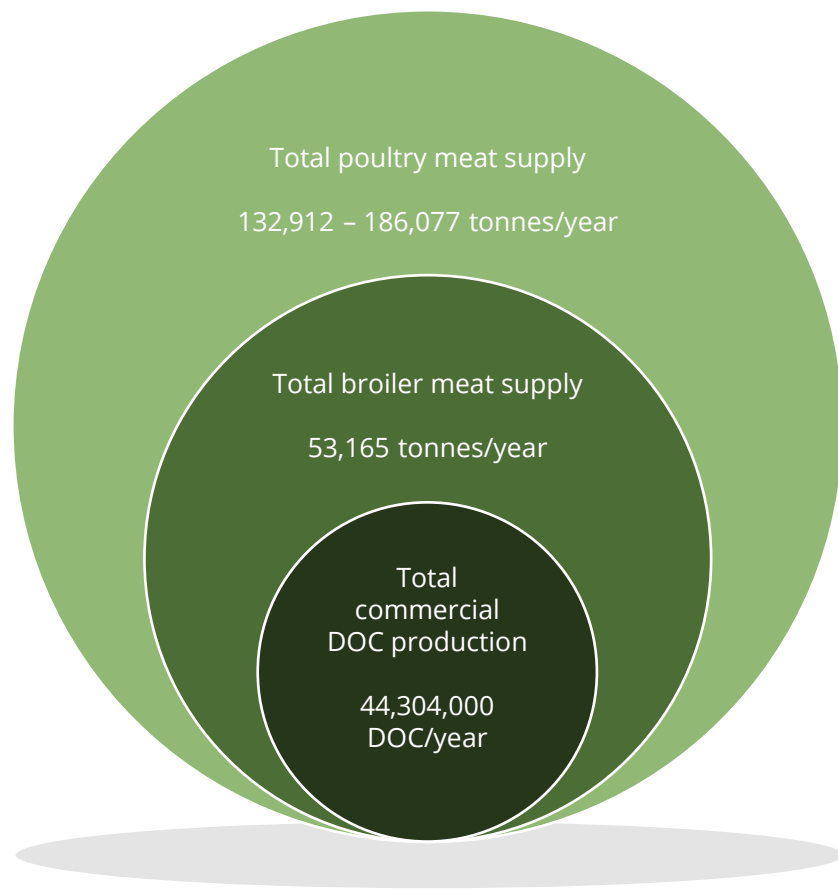
Geographical overview of poultry sector

Concentration of poultry farming in Central and North-West Uganda



Production broiler

Significantly higher poultry meat production than the official figures suggest



Total poultry meat supply

- Apart from broilers, there are a large number of indigenous chickens, layers and hybrid chickens raised in the country. These are all consumed for meat as well, making up an estimated 75% of the market. This study assumes a dressed weight of .6-1 kg for these birds.
- The estimated poultry meat supply translates into **3.2 to 4.4 kg/capita**. Even at the lower estimate, this significantly higher than the FAO estimates.
- This would make it the **third most produced animal protein in the country** after beef and fish. Total meat exports are not clear due to the informal nature of the trade.

Total exotic broiler production

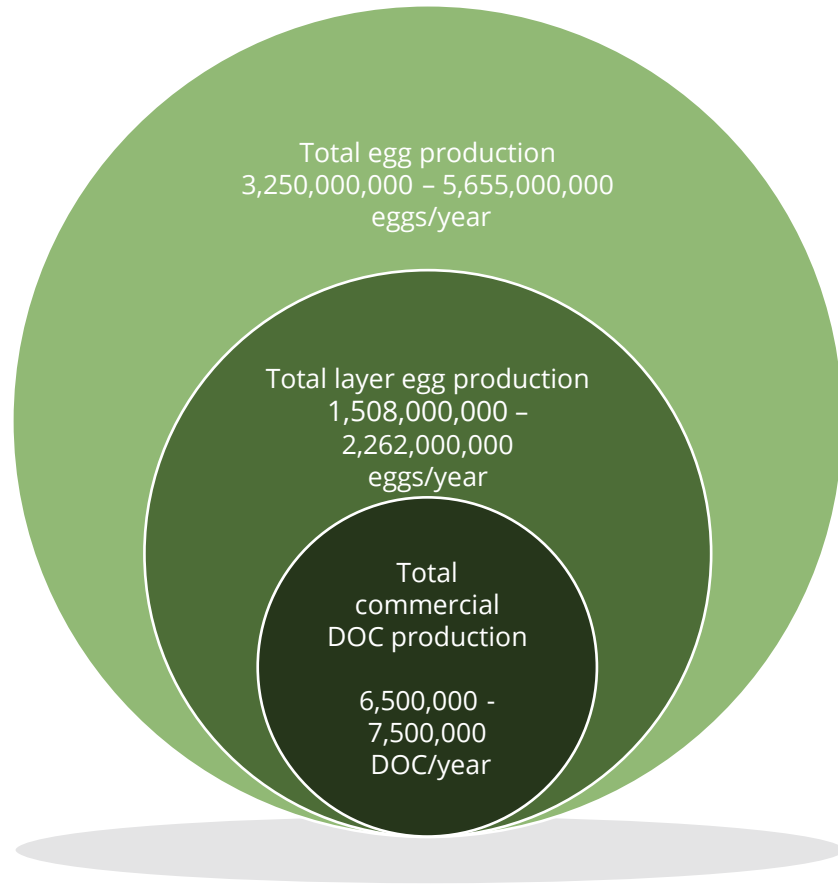
- Based on the below DOC production and a dressed weight of 1.2 kg, a minimum broiler meat supply of **53,165 tonnes/year** is estimated.
- This is likely to be a **conservative estimate**, as there are a large number of smaller local hatcheries producing broiler DOCs that are not included in this calculation.
- The FAO estimates **15%** of the number of birds to be exotic. Sector experts interviewed in this study assess this to be in the range of **20-30%**.

Total commercial broiler Day Old Chick production

- The total production of Broiler DOC by the top 8 players on the market is estimated to be **852,000/week**. This is a key determinant variable for estimating a total poultry market size.
- This production is dominated by a number of large players, with the top 3 players producing **630,000 DOC/week**.
- DOC production over the year varies, with a number of players entering the market during peak season or adjusting production in low season. The above are weekly averages.

Production layer

Significantly higher egg production than the official figures suggest



Total egg production

- Apart from exotic layers, there are a large number of indigenous chickens and hybrid chickens raised in the country. These also produce eggs, although the number of eggs per bird and total market size is difficult to assess. The UBOS estimates that 20% of the egg production in the country is from exotic chickens. Based on sector experts assessments, this study assumes this share to be higher, **between 40 and 50%**.
- This leads to a total egg production estimate between **3,25 and 5,66 billion eggs**, a **factor 3 to 6 higher** than the official figures. However, many of these eggs are exported to Kenya or South Sudan.

Total layer egg production

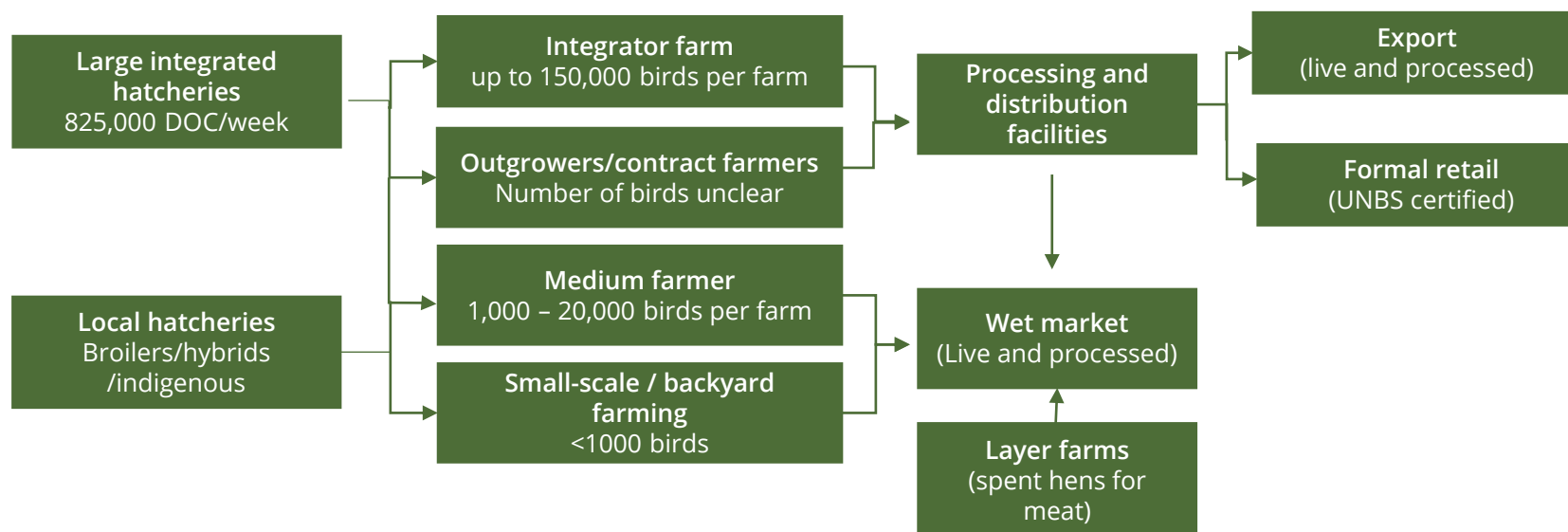
- Based on the below DOC production, an average production of 200-300 eggs per layer bird, a minimum egg production of **1,5 billion exotic layer eggs** is estimated.
- This is likely to be a **conservative estimate**, as there are a large number of smaller local hatcheries producing layer DOCs and significant imports of layer DOCs from the Netherlands that are not included in this calculation.
- However, **a large proportion of these eggs are exported**. The larger egg producers in the sector indicate to export **60%** of their eggs to Kenya and smaller producers also indicate that their eggs are exported to Kenya and South-Sudan.

Total commercial layer Day Old Chick production

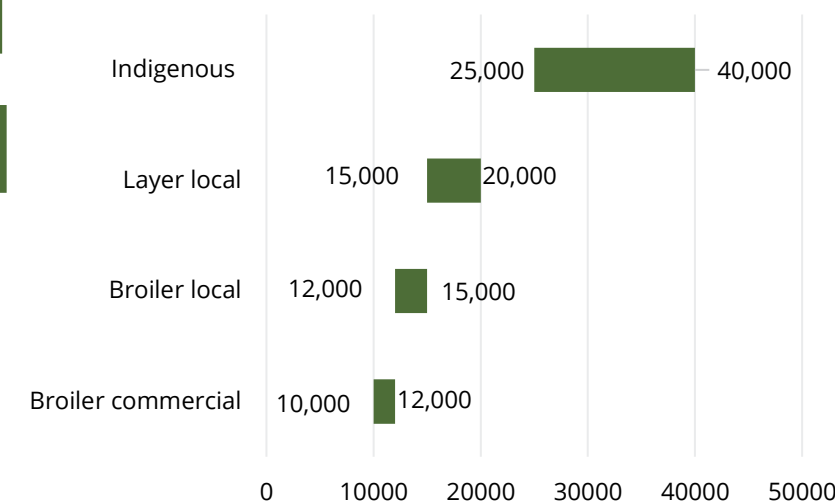
- Our best guesstimate of the total production of layer DOC by the top 6 players on the market is between **125,000 to 145,000/week**. However, this production should be considered a best guess, as the layer DOC market has a number of new entrants whose production is not clear, is relatively fragmented and subject to import/export dynamics.
- DOC production over the year varies, with a number of players entering the market during peak season or adjusting production in low season. The above are estimated weekly averages.

Broiler value chain

Wet-markets are still the predominate sales channel, with a growing but highly competitive retail sector



Price of live birds on wet market (UGX/Bird)



Two main hatchery segments can be identified:

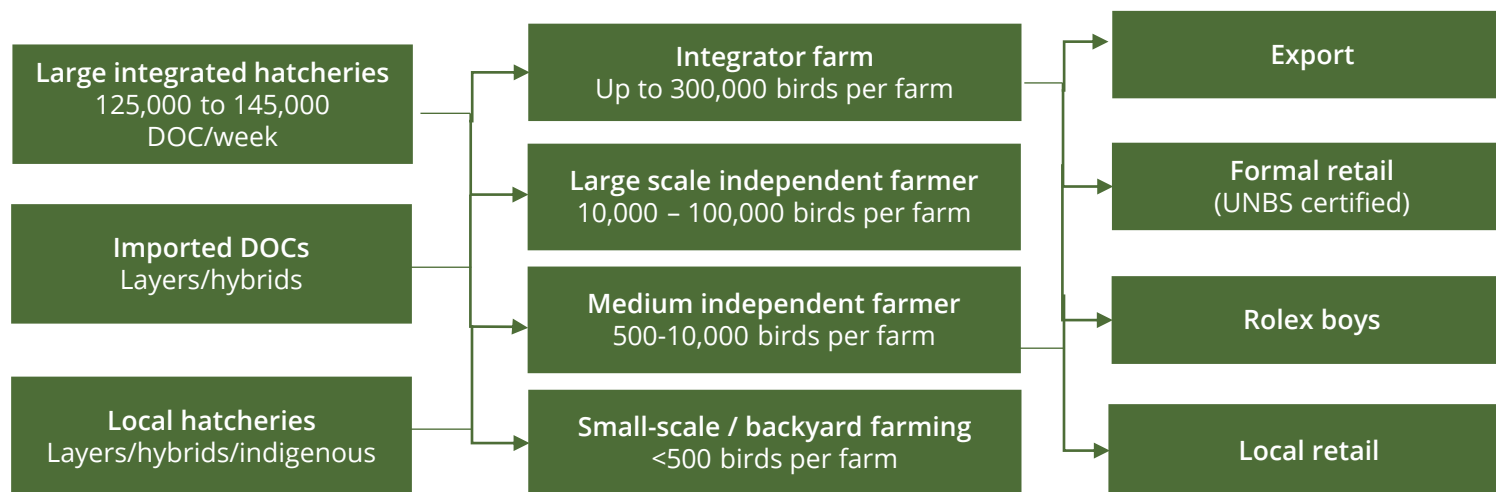
- Large hatcheries, who rely on breeder farms with imported parent stock. **Their distribution network is mainly centred around Kampala.**
- Smaller players, who both sell DOCs from their own small parent flock or allow for local farmers to use their hatchery to hatch eggs from their hybrid or exotic bird flock. **This leads to major biosecurity risks.**

- A number of players have entered or expanded their integrated operations in recent years. **As a result, the number of commercially grown broilers has increased significantly.**
- Many poultry farmers are **seasonal**, stocking their houses when the maize prices are low or targeting the festive seasons.
- Smaller players complain about the **low quality of DOCs**, as the integrators keep the best chicks for themselves or provide them to their major customers.
- Local and small-scale farmers produce the majority of poultry meat production, mainly keeping indigenous or dual purpose breeds such as Kuroiler or Sasso.

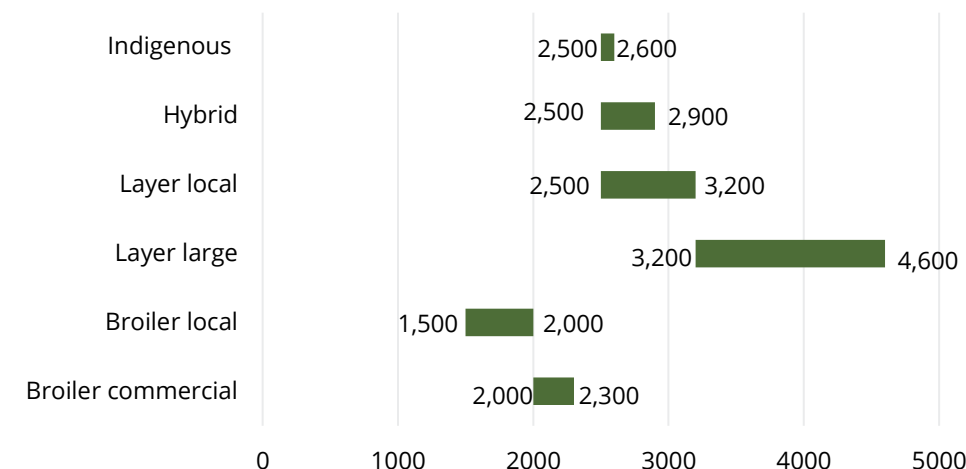
- Chicken is seen as a premium product, often consumed at festivals or weddings. Overall, live chicken is still preferred in Uganda. These are sold road-side or on wet-markets such as Kalerwe, Nakesero or Nakawa. They are either butchered under non-hygienic conditions on-site at the market or brought home. **These markets pose a major health risk, both in food safety as well as a hotspot for possible disease outbreaks.**
- Live birds are brought to the market by traders who buy them at farm level, where indigenous chicken is sourced from rural areas. Major integrated players have also started supplying live and dressed chicken on the wet markets for lower prices.
- As a result, **competition has increased dramatically and a number of farmers and traders have had to exit the market.** This has led to a significant distrust of local actors against foreign funders or donor initiatives, as these fund integrators.

Egg value chain

A growing segment of medium farmers is changing the market



Price of DOCs per type (UGX/DOC)



- Apart from the larger, integrated players who also supply broiler DOCs, the layer market is characterized by a number of smaller hatcheries.
- These hatcheries either have their own parent stock or import their DOCs.
- **Dual-purpose birds, locally known as hybrids, are preferred by small-scale farmers.** A number of hybrid breeds are on the market, such as ken-bro, Sasso or kuroilers.

- Compared to the commercial broiler market, **the layer market is far more fragmented.** Apart from the major integrated companies, who predominantly export, there are a large number of mid-size and large independent farmers. There are a lesser number of small-scale layer farmers.
- **These mid-and large-size layer farmers have been growing at a fast rate in the last years, commercializing and expanding rapidly.** These farmers have a significant interest in adopting new technologies and knowledge. Many of them also export their eggs through traders.
- Conversely to the broiler market, these players are not reporting increased competition **but all report strong market growth.**
- Whereas commercial poultry meat production is centred around Kampala, egg production is more divided over the country.

- A significant proportion, up to 60%, of the eggs produced by the main players is exported to primarily Kenya. These also supply the major supermarkets, although this is only a small share of the overall market. Rural egg producers report exports to neighbouring countries such as the DRC or South Sudan.
- As there is limited market segregation in terms of commercially or locally produced eggs, the overall market for eggs is larger and more accessible to smaller players.
- Consumption and demand for eggs is increasing in the country, predominantly through the popularity of Rolex chapatis. This egg based convenience product is very popular under the growing group of single Ugandans and is driving a growth of demand.
- Rural demand for eggs is considerable and growing.

Sector analysis – Degree of vertical integration

Main players in the sector

- There are a number of highly integrated, dominant players active in the Ugandan poultry market. A number of these, such as Biyinzika or S.R. Afro **are expanding rapidly with foreign investment**.
- These dominant players often expand through vertical integration, which is changing the competitive landscape. **Downstream players who specialized in trade and processing are faced with increased competition**. For example, whereas Biyinzika previously had a supply contract with the large slaughterhouse of Yo Kuku, their construction of a slaughterhouse means they will now slaughter in-house and introduce additional supply of dressed chicken on the market.
- As the high-end retail market for frozen chicken or chicken parts is limited, these **integrated players are increasingly supplying on the general wet markets**, both with live and dressed chicken. Due to the scale advantages, **they can supply at a lower price and are pushing smaller players out of the market**.
- This is further problematized due to the role of these large players as DOC or feed suppliers to smaller players. They therefore **directly compete with the off-takers of their product, leading to an unsustainable market situation and friction**.
- A number of predominantly foreign dedicated hatchery companies are capitalizing on this friction and the low quality of local DOCs by **supplying high quality DOCs on the market**.

Value chain integration

	Upstream				Midstream			Downstream			
	Grand parent farm	Parent farm	Feed production	DOC sales	Broiler farm	Layer farm	Outgrowers	Slaughtering house	Wholesale depot	Cooled transport and distribution	Retail outlets
Biyinzika		X	X	X	X		X	X	X	X	X
Ugachick		X	X	X	X		X	X	X	X	X
Yo kuku			X		X		X	X	X	X	X
Quantum Foods		X	X	X		X			X		
Kukuchic		X		X							
S.R. Afro		X	X	X	X	X		X	X	X	
Asiima		X		X							
Uzima (Rwanda-based)			X	X							
Kenchic (Kenya-based)				X							
Royal Kuku					X		X	X		X	X
Zai Poultry Farm							X	X			
Meat packers								X		X	

Production system overview – Broiler

Smaller farmers are faced with many constraints to their business

	Small-scale farming	Medium farmers	Large integrators
Source DOC	Local hatcheries/agro shops	Major DOC providers/ DOC dealers	Own hatchery
Production system	Local shed	Open house	Closed house
Knowledge level	Low/no trained staff	Several years of experience	Highly trained staff
Source of information	Sellers of inputs like feed	Other farmers, hire extension services	Trains staff abroad, hire European consultants for training
Biosecurity	Low, no measures	Some measures, such as footbaths and restriction of visitors	Near-western standards
Disease prevalence	High, 40-50% of the birds is often lost to diseases	Lower, between 3-5% mortality.	Low, 2-3%, although diseased parent flock occurs
Veterinary service	Government extension services	Hire vets	Vets on payroll
Source of medicine	Local vet shop, often fake or adulterated	Vet shop or imports, often problems with poor quality	Import
Feed type	Homemade feeds, sometimes made with concentrates.	Pelleted feeds or homemade feeds made with concentrates.	Pelleted feed
Source of feed	Homemade	Homemade or feed producer	Own feed mill
Harvest size	0,8-1,2 kg	1-1,5 kg	1,5-2 kg

Small-scale farming in Kampala



Medium scale farming

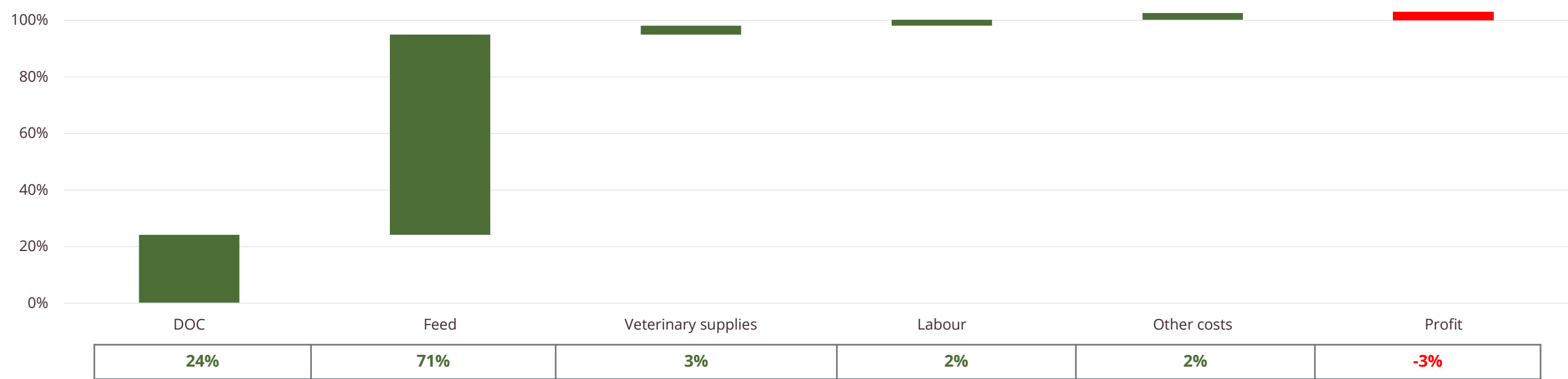


Production system overview – Broiler cont.

Small scale farmers are most likely making a loss

- Due to the high costs of inputs, **many small scale farmers are estimated to be making a loss in poultry farming**. Given differences in feed usage efficiency and management practices, this is likely to vary among the different small scale farmers. However, many do not know their own profitability. This segment of farmers is likely to be outcompeted in a ever consolidating market.
- Feed costs make up 70% of the production costs of small scale farmers. Many small-scale farmers enter the poultry business when maize prices are low. However, as a result of the many new entrants, prices for poultry products also lower when chickens are ready for market.
- High disease prevalence and low weight of supplied DOCs lead to significant mortalities among small-scale farmers.

Estimated price breakdown of small scale broiler farmers as percentage farm gate price

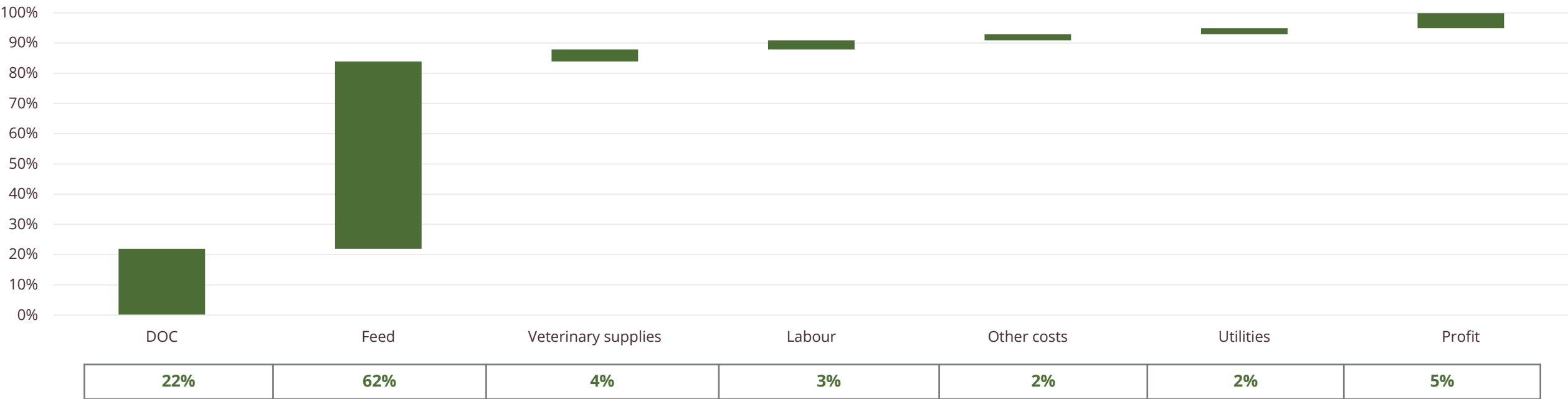


Production system overview – Broiler cont.

Medium-scale farmers are making a small profit, but will have to grow to not be outcompeted by the expanding integrators

- Medium scale farmers report significant mortalities due to disease outbreaks and other factors. **Due to the open houses and open water drinking systems, diseases can easily enter and spread.**
- There is still limited use of modern technology in these segment, including semi-closed or closed housing. A shift to semi-closed houses, with on-farm feed storage and mixing and a higher level of technology adoption will lower production costs and allow medium scale farmers to compete with the larger companies in the future. Smaller investments, such as in automatic feeding lines, will also significantly improve production efficiency and biosecurity.

Estimated price breakdown of medium scale broiler farmers as percentage farm gate price



Performance overview – Layer

Medium and large independent farmers have significant number of chickens but apply limited technology.

	Small-scale farming	Medium or large independent farmers	Large farms or integrators
Source DOC	Local hatcheries/agro shops	Major DOC providers/ Imported DOC from Kenya or Europe	Own hatchery/ Major DOC providers or imports
Type of bird	Indigenous or Kuroiler/Sasso breeds	Hybrid breeds	Hybrid breeds
Production system	Deep litter system in open sheds	Deep litter or cage systems in open housing with fencing.	Closed house with automated systems.
Source of information	Sellers of inputs like feed	Other farmers, hire extension services.	Trains staff abroad or bring in foreign staff.
Biosecurity	Low, no measures	Some measures, such as vaccination, footbaths and disinfection.	Near-western standards
Disease prevalence	High, with diseases often wiping the entire flock.	Lower, between 10-15% mortality.	Low, 5-10% mortality
Veterinary service	Government extension services	Hire vets or use government extension services.	Vets on payroll
Source of medicine	Local vet shop, often fake or adulterated.	Vet shops from container village.	Imported
Feed type	Homemade feeds, sometimes made with concentrates.	Predominantly farm-mixed feeds made with concentrates.	Layers mash
Source of feed	Homemade	Farm-mixed or from feed producer	Own feed mill
Eggs/laying period	50-100	240-280	300-320

Medium open house layer farming



Large scale layer farming

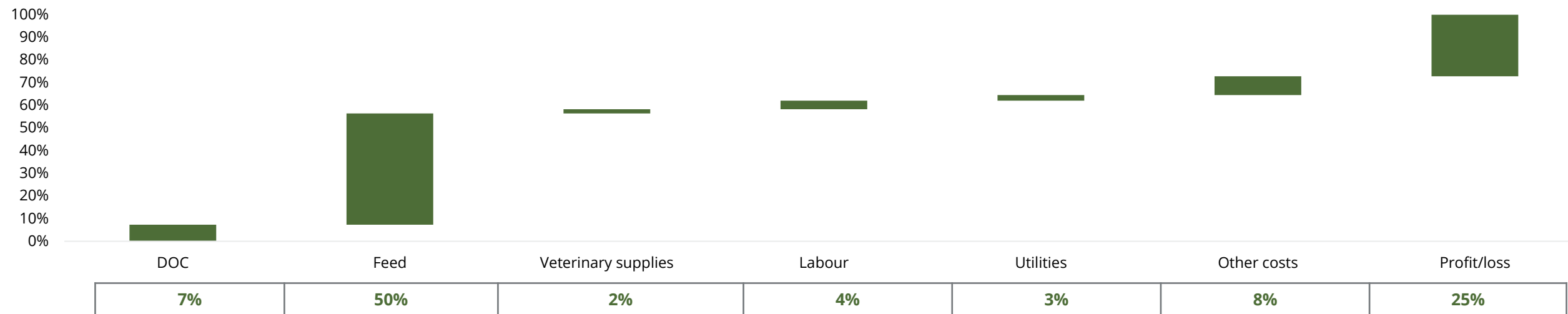


Production system overview – Layer cont.

Medium and large farmers are profitable and growing, providing business opportunities for technology

- Medium size layer farmers are reporting a **high interest in automated or other more capital intensive systems**. These include automatic chain feeders, battery cages and automated drinking systems. The key reason for farmers wanting to invest in these systems are lowering disease infection rates and mortality. Capital constraints are often cited as the reason preventing further expansion. However, **many of these farms are growing fast and will invest more in the coming years**. This provides significant business opportunities for technology providers.
- This growing group of farmers are also **in need of better training on disease management, nutrition and water management**. This latter is especially important, as there is limited awareness of proper water management.
- **Key constraints** for further growth mentioned were the seasonality of feed inputs, the lack of independent testing facilities for feed or veterinary supplies and a lack of training facilities. An integrated facility, providing training, demonstrating technology and a mobile testing lab specifically targeting the middle-and large-size layer farmers would greatly benefit the sector while providing business opportunities.
- The figure does not take into account profits from the sale of spent hens or chicken droppings, both significant sources of income.

Estimated breakdown of operational costs of a commercial layer farm as percentage farm gate price



Overview - Breeding

Lack of quality genetic material for smaller farmers.

- Within Uganda, there are 6 major suppliers of genetic material in the country, of which one is operating out of Kenya. These already operate on a **high-technological level, using hatchery technology from the Netherlands or other developed countries.**
- However, there is a lack of quality genetic material available to smaller to medium farmers in the country. The supply and quality of available DOC's fluctuate dramatically, with the **sale of second class or even diseased DOC's occurring.** Integrators sell their second-class DOCs on the open market, whereas they keep the first-class for their own integrated operations or out- growers.
- The regulation of the supply of DOCs is poorly enforced **and farmers are lacking access to independent testing or quality assurance.** Farmers are currently only assessing on the basis of bodyweight instead of using more reliable standards such as Pasgar score, chick length or free yolk body mass.
- There are currently **no Grand Parent Farms (GPS) in Uganda.** This means that the poultry actors have to import their parent stock from other African countries such as Zambia or South Africa or even further from Europe or India. **This results in higher costs and unreliability of supply.** It can take several months to bring in a new parent stock, during which production has to be halted in the case of a disease outbreak. **The COVID-19 outbreak has shown the risks involved in relying on foreign inputs for local production. Entry of DOCs from abroad have halted, leading to numerous farmers unable to stock their houses and incurring major losses.**
- The high transport costs in bringing breeding stock from abroad also prevent smaller local players in their ability to enter the breeding market. As well, the high transport costs and long supply time combined with the lack of regulation and health control also incentivizes local players to retain their diseased flock and sell diseased DOCs. A number of foreign players such as Kenchic have entered the DOC supply market and their products are generally seen as having a higher quality.
- For the smaller farmers, the newly introduced Sasso chicken could improve access to quality genetic material. The Sasso chicken is a dual-purpose bird, with coloured feathers and structured meat. These are features that are preferred in the Ugandan market.
- The Sasso chicken is not as efficient as a layer bird, but still performs better than indigenous chickens. As the Ugandan poultry meat market is not very segregated, illustrated by the relatively high price received for layer birds at slaughter, rearing the Sasso chicks allows smaller farmers to benefit from the growing demand for both eggs and chicken meat products. The eggs for this bird are currently being imported from Tanzania and Rwanda, but there are no parent stocks in Uganda yet.
- A project has been started by Hendrix Genetics in collaboration with the Bill and Melinda Foundation to promote the Sasso chicken in the region. Uzima, a recent new entrant on the market from Rwanda, is also starting to supply Sasso chicken DOC's in Uganda. Uzima is supported among others by DFID through the AgDevCo investment fund.



Supplier	Number of broiler DOCs/week	Number of layer DOCs/week
Biyinzika	300,000	35,000
Kenchic	200,000	35,000
Ugachic	130,000	35,000
Kuku chic	100,000	20,000
Quantum foods	80,000	15,000
S.R. Afro	30,000	5,000

Overview - Slaughtering

Most chickens sold live at wet markets but increasing capacity in formal slaughtering.

- Chickens are predominantly sold live and brought home or slaughtered at wet markets. **Only a small percentage is slaughtered and processed in a hygienic and safe manner.**
- The **slaughterhouse capacity is increasing**, with Biyinzika opening a modern slaughterhouse in 2019 and Yo Kuku opening a highly mechanised slaughtering facility in 2014. Biyinzika previously supplied to Yo Kuku but it's supply contract is due to expire in June. This is likely to (temporarily) lead to overcapacity in formal slaughtering on the market.
- Although expanding with the growing middle-class in the country, the market for chicken parts or dressed chicken is still small in Uganda. Therefore, **major players are looking at the export market for further growth.**
- **Waste management is in place to some degree** at the local slaughtering facilities. Heads, legs and intestines are sold as pet food. For the facilities in Kampala, other solid wastes are handled by the KCCA. The liquid waste is drained into the general sewage.
- **Lack of reliable cold storage is hampering local slaughtering facilities**, with power outages, faulty freezers or poor transport leading to spoilage of chicken.

Company	Capacity (birds/day)	Slaughtering processes	Food safety level
Yo Kuku	30,000	Chain slaughter	High
Ugachick	10,000- 20,000	Chain slaughter	High
Biyinzika	15,000	Chain slaughter	High
Royal Kuku	5,000	Chain slaughter	High
Zai poultry farm	3,000	Manual	Low
Meat packers	2,000	Manual	Low
Jubilee farms	2,500	Manual	Low

Local processing facility



Overview – Veterinary system and diseases

High prevalence of fake or adulterated vaccines on the market with growing antibiotics resistance.

- One of the key issues reported by farmers is the presence of **fake or adulterated vaccines and medicine** sold at retail level. This is not only true for those veterinary supplies sold in Container Village, the main drug market in Uganda, but also for those in rural areas. This problem is so severe that the government has implemented a special branch of police, the Agricultural Police, which is to combat counterfeit veterinary drugs on the market.
- Larger farmers often hire vets or have veterinary officers on site. **Rural farmers lack access to vets** and the private veterinary extension service is not adequate for the service of the many livestock farmers.
- **There is a shortage of trained vets in the country.** This is also due to the preference of many trained vets to sell inputs in container village or other stores over being a farm veterinarian. Vets can earn significantly more money selling veterinary supplies than by administering drugs or diagnosing diseases on site. As a result, farmers often administer the drugs without proper information provision.
- There is a **high disease prevalence on the small and medium farms in the country**, aggravated by the poor biosecurity and veterinary practices. Poultry products have a high prevalence of salmonella and there is significant and growing antibiotics resistance, especially in larger farms. Understanding of veterinary medicine application and antibiotic use is low, further aggravating **the risk of increasing antibiotics resistance in the country.**
- The regulatory framework is not always conducive to development. A current ban on the import of coccidiosis tests is hampering the tackling of this disease.

Common diseases	Mortality
Gumburo	Very high
Newcastle disease	Very high
Mycoplasma	Dependent on the type significantly
Infectious bronchitis	Low but affects overall growth
Coccidiosis	Significant and affects overall growth
Marek's disease	Up to 50% in unvaccinated flocks, many DOCs are vaccinated against it.
Pullorum disease	Significant, especially in young birds
Fowl pox	Low but affects growth and product quality
Fowl typhoid	Very high

Market developments – Key drivers for growth

Poultry market growth is likely to be shaped by three main factors.

New or expanding integrated farming companies

- Recent entry of new companies such as SR Afro or the rapid expansion of existing players such as Biyinzika with foreign investment is driving further consolidation and integration of the market.
- These integrators are likely to capture a larger market share and outcompete local farmers. These smaller farmers will either have find their own market niche or also integrate and expand.

Increasing demand for convenience products

- The increasing number of single Ugandans and the growing middle-class is increasingly demanding convenience and fast food products.
- This is exemplified by the popularity of Rolex chapatis and KFC and other fast food joints in Kampala.
- This increased demand for convenience products is likely to push the demand for processed chicken products and eggs in the future.

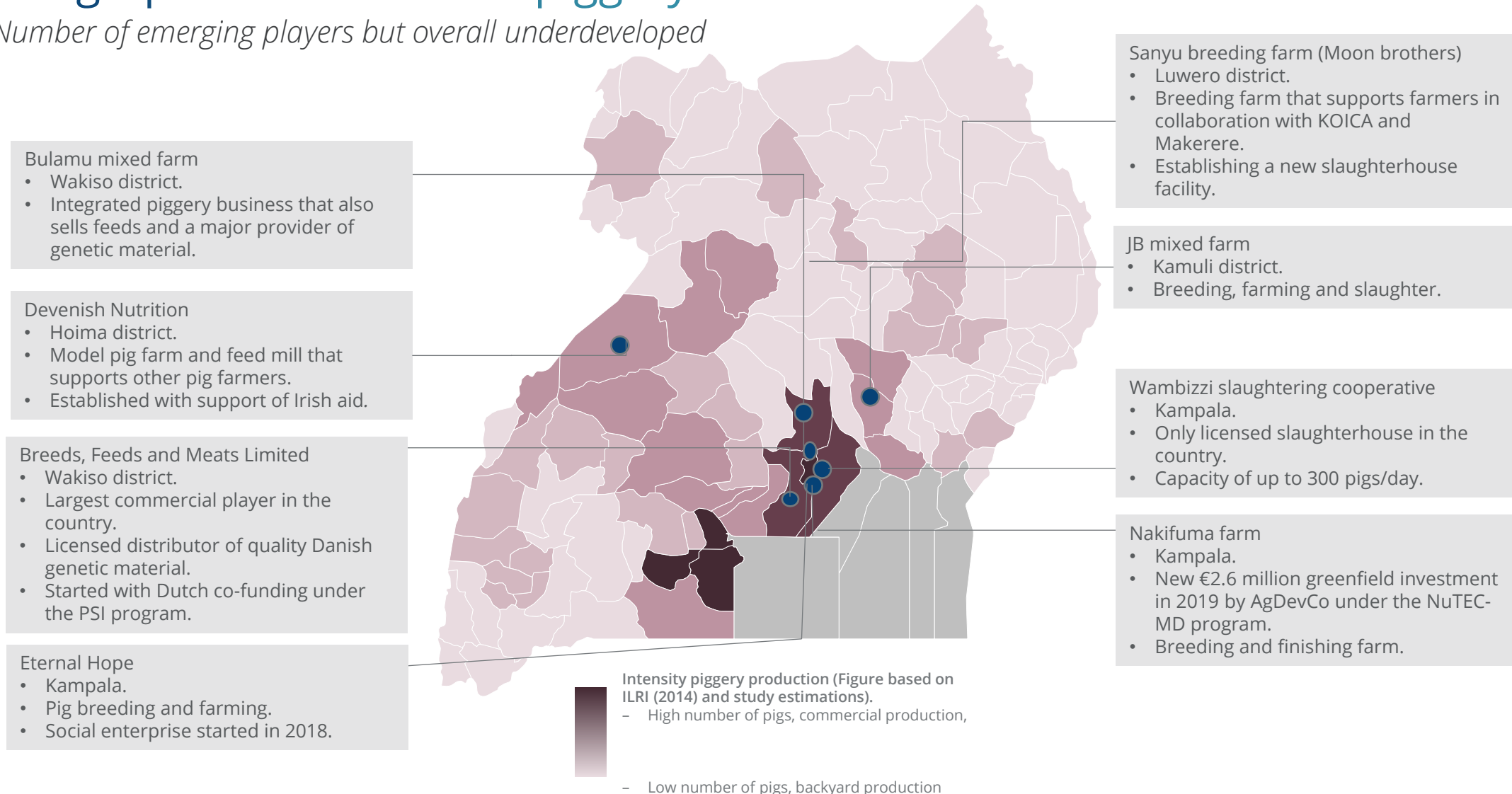
Increased export orientation

- A number of companies are increasingly looking at the export market for their products. Due to the high production of maize in the country, Ugandan poultry farmers can produce at a relatively low cost price.
- Export has received a major boost by the lifting of the import ban of Ugandan poultry products by Kenya.
- Major egg producers already export around 69% of their products.
- Smaller farmers, especially those producing eggs, are also increasingly looking for export possibilities.

Piggery market analysis

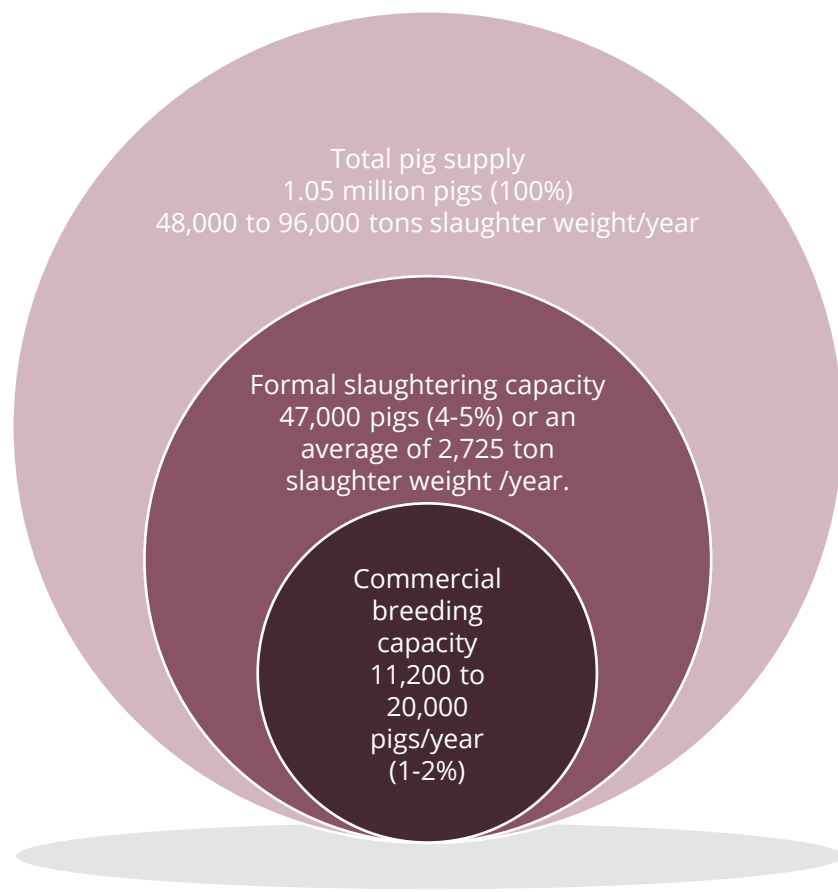
Geographical overview of piggery sector

Number of emerging players but overall underdeveloped



Production of pigs

Large difference between official pig numbers in the country and formal breeding or slaughtering capacity



Total pig meat supply

- According to the MAAIF, there are a total of 4.2 million pigs in Uganda, of which 25% are slaughtered each year. This is likely to be an overestimation but a total supply is difficult to estimate due to the fragmented producers landscape.
- Assuming a slaughter weight between 40 to 80 kg, this would mean a total pork meat supply between 48,000 and 96,000 ton.
- This translates in a per capita supply between 1 to 2 kg.

Total formal slaughtering capacity

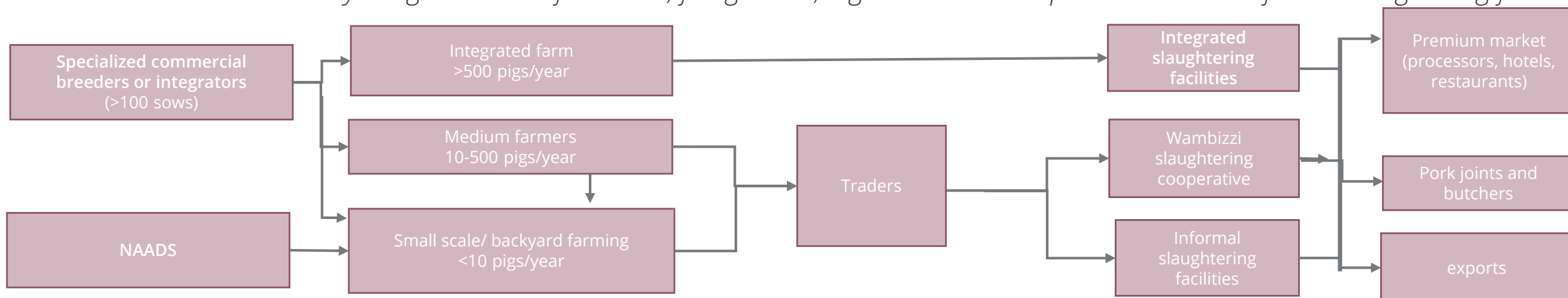
- The only formal slaughtering facility in Uganda, Wambizzi cooperative, slaughters on 3,500 pigs per month at an average weight of around 50kg. This means a **total of 42,000 pigs and a total slaughter weight of 2,100,000 kg.**
- The largest integrated pig farmer in the country produces another **5,000 carcasses a year at a higher slaughter weight of 125 kg per carcass.** These two form the total formal slaughtering facilities in the country, with many informal slabs and abattoirs existing throughout the country.

Total commercial breeding capacity

- The total number of breeding sows of the top 10 largest players in the country is estimated to be around **800 sows.** The establishment of Nakifuma Farming Company would raise this number to around **1,200 sows.**
- The number of piglets per sow per year ranges from 14 to 24, with one breeder averaging 33. On average, this would mean a total of **11,200 to 20,000 piglets per year.**

Pig value chain

Value chain characterized by a high number of breeders, few growers, high trader market power and limited formal slaughtering facilities



The market is characterized by a high number of breeders with no quality control.

- As stated by one respondent: **“everybody wants to be a breeder, nobody wants to be a fattener”.**
- There is an oversupply of piglets and gillets, with up to **50% of the produced piglets not being sold.**
- NAADS hands out free pigs under the Operation Wealth Creation. These pigs are often of poor genetic quality.

Apart from a small number of integrated farms, there are few commercially operating fatteners. **Most medium farmers also sell piglets to smallholders.**

- Pigs are predominantly raised by smallholder farmers, whose profitability is limited.
- Pigs are often seen as a type of insurance, to be sold when money is needed. **This means that the quality of the meat is often poor and farmers are in poor negotiation position.**
- Many farmers face large losses due to African Swine Fever causing them to exit the market.
- **Prices for pork are similar in rural areas as in urban areas.**

Traders have enormous market power in the pig market, distorting the overall market.

- In order to slaughter at the **only formally recognized slaughterhouse Wambizzi**, one has to be a trader and member of the cooperative.
- Informal slaughtering facilities are also owned by traders, **leaving no open slaughtering facilities to small or medium farmers.**
- **Traders abuse their market power** and offer low prices, cheat with the sales weight or even inflict bodily harm to the pigs of farmers to lower the sales price of the animal.
- This significantly impacts the profitability of pig farmers.

- **Pork is predominantly sold in pork joints**, roadside pork restaurants.
- There is a limited processing or premium market. **These players are having difficulties sourcing quality meat.** Most notable processors and formal retail are Fresh cuts, Shoprite and Sausage King.
- Some carcasses are exported to Kenya or South Sudan. Traders from Nairobi purchase carcasses in Kampala for export. Farmers near South-Sudan used to export animals, although a local industry is developing there.
- In general, **there is a low demand for quality meat due to a limited awareness and differentiation on the market.** However, a trend towards a demand for quality leaner meat can be identified. Butchers and pork joints have to cut away less fat and meat with a good quality pig, **increasing their overall yield from a carcass and improving their business case.**

Degree of vertical integration of main players in the sector

Main players in the sector

- There are only a few integrated pork enterprises in the country. **None of these players have the level of development of the poultry players**, with for example no silo feed storage.
- There are a high number of specialized breeders, who predominantly sell piglets. This includes governmental agencies such as NAGRC & DB. Some also fatten a number of their pigs.
- A number of former or current high-level army personnel also own breeding farms.
- None of the identified players have their own retail or pork joints. The retail sector is segregated.
- There are a number of new entrants or developments in this industry. The recent establishment of Breeds Feeds and Meats Limited is a key driver for sector growth. The establishment of Nakifuma farm, if carried through, would provide a similar boost.
- Similarly, a planned investment by Sanyu farm, also known as MAP Co. Ltd., in a new slaughtering facility will significantly boost the sector, especially if combined with a development intervention to improve the availability of quality meat.

	Upstream		Midstream	Downstream			
	Breeding	Feed production	Fattening	Slaughtering	Processing	Cooled distribution	Retail outlets
Breeds Feeds and Meats Limited	X	X	X	X	X	X	
Bulamu mixed farm	X	X	X	X	X		
Nakifuma farm (under construction)	X		X				
Sanyu farm	X	X					
Devenish Nutrition	X	X	X				
Eternal hope	X		X				
Gen. Wamala	X						
Captain Lutaaya	X						
JB Mixed farm	X		X	X	X		
Wambizzi slaughtering cooperative				X			
NAGRC & DB	X						
Fresh Cuts Ltd					X	X	

Production system overview

	Small-scale farming	Medium breeders and farmers	Large integrators
Source genetics	Free mating, NAADS or local breeder	Bulamu farm or imported	Imported
Production system	Free range/ wooden pens	Concrete pens or IMO	Indoor pens
Knowledge level	Very low	Low but increasing	High
Source of information	Other farmers, NGO trainings	NGO trainings, other farmers	Foreign suppliers
Biosecurity	Non-existent	Low to medium	High
Disease prevalence	High	High	Medium
Veterinary service	None	Local vets	Local vets/on-farm vet assistants
Source of medicine	Container village	Container village	Container village/imported
Feed type	Household waste or other waste products	Compounded or concentrate-based	Concentrate/ premix own feed production
Source of feed	Household or farm waste	On-site feed mixing or Devenish	On-site feed mixing
Harvest size	30-60 kg	50-90 kg	80-125 kg

Small-scale pig farming



Medium scale breeder in outskirts of Kampala

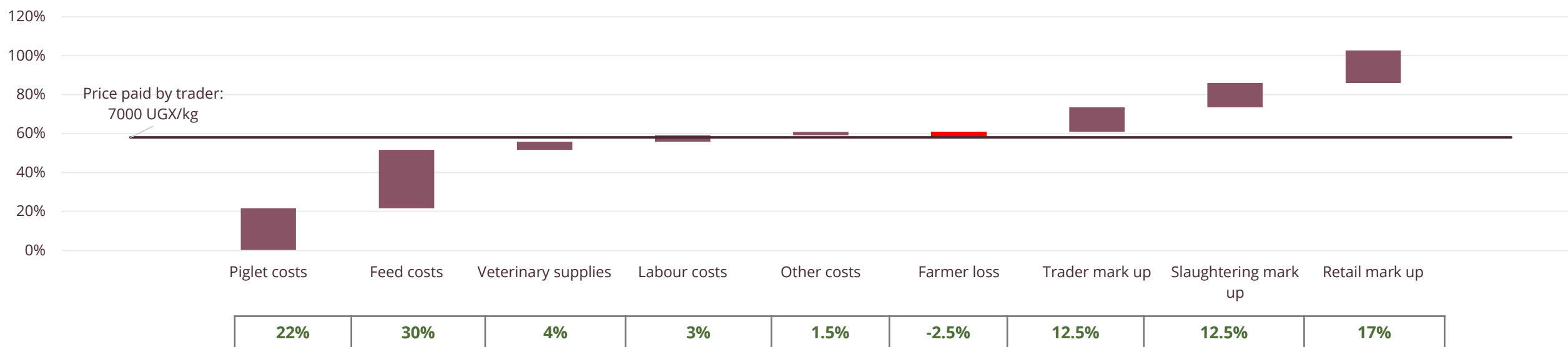


Production system overview – Pig

Producing pigs for slaughter is currently not profitable in Central and Western Uganda.

- Commercially producing pigs is currently not profitable in Central Uganda, the primary production area. Even excluding labour costs, costs of production are above the general price paid by traders. This also does not take into account that pigs are not weighed at sale but estimated by eye on site. **Sales weight is often purposely underestimated by traders.** For example, this means that a farmer will be paid for 40 kg of pig instead of its actual weight of 60 kg.
- This is echoed by many stakeholders in the sector, who report that selling pigs for slaughter alone is not profitable. **It is only profitable when also piglets and manure are sold, explaining the high number of breeders in the country.**
- Between farm gate price and the wholesale price of carcasses, there is a significant mark-up of an estimated 25% or 3,000 UGX/kg. As many of the traders also slaughter the pig, they take a significant portion of the total price.
- Larger players, who slaughter themselves, produce quality meat and obtain a higher slaughter weight, are reportedly able to make a profit. Similarly, smallholder farmers feeding scraps or forage are also profitable due to negligible feeding costs.

Price breakdown in percentages of retail price in pork joints



Overview - breeding

Lack of quality genetic material for smaller farmers.

- There are a high number of informal breeders in the market. These are often small, less than 20 sows per farm. The quality of the piglets produced by these breeders is low, with a high level of inbreeding.
- There a number of players that have or are starting to invest in better quality genetic material. This genetic material is generally brought in from Denmark or South Africa.
- Within Central Uganda, there are around 10 players that have more than 20 sows. There are also a number of other players in Northern or Eastern Uganda that have similar numbers of sows. **These players are looking to expand**, as they face a high demand for their piglets and are geographically somewhat protected from competition.
- In general, the quality of genetic material is low in the country, **with a breeding stock characterized by a high level of inbreeding**. Limited genetic material is brought into the country and hardly any investments in replacement genetics to prevent inbreeding are done.
- Most farms use natural mating, with only limited use of Artificial Insemination. This breeding, especially when boars are transported between farms, leads to the spread of African Swine Fever. Makerere University is currently carrying out an initiative to promote Artificial Insemination.
- There is a surplus of low-quality breeders in the country, with no method or certification for the consumers to identify those breeders providing high quality genetics. A frequently touted solution by stakeholders is the **establishment of a national breeders database**, that independently identifies the quality of breeders in the country. This would allow farmers to identify high-quality producers and source accordingly. PigBoost, an initiative funded by DFID, is trying to put such a breeders register in place in a number of counties.

Breeding in the outskirts of Kampala



Supplier	Number of sows
Sanyu breeding	100-200
Breeds Feeds and Meats	100-200
Bulamu mixed farm	90
JB mixed farm	100-200
Gen Wamela	20-50
Nakifuma farm	390

Overview - Slaughtering

Only one slaughterhouse formally registered

- There is currently only one slaughterhouse formally registered in Uganda. This is the Wambizzi Cooperative Society Ltd. In order to slaughter at Wambizzi, an individual has to be part of the group of traders that make up the cooperative.
- Slaughtering practices and health practices are higher at Wambizzi than in the informal slaughtering sector. There is a veterinarian on site who approves the pigs health and provides a quality stamp on the carcasses.
- Apart from Wambizzi, there are many informal slaughtering slabs and abattoirs. In 2017, 68% of the meat sold in pork outlets in Kampala was sourced from these informal slaughterhouses (Kungu et al., 2017). These are not formally registered and do not follow proper procedures. This affects the quality of the meat and the environment. These informal slaughter facilities are often owned by traders. At some of these facilities, fake stamps are applied to the carcasses, mimicking the Wambizzi veterinary officers seal.
- Diseased pigs are often still sold and butchered. This leads to the spread of African Swine Fever and poses a significant health risks to pork-borne infections such as *T. solium* cysticercosis, *Echinococcosis* and *Trichinellosis* (Kungu et al., 2017).
- One integrated actor has constructed a small quality slaughtering facility. Although small, it allows for the better quality meat production.
- A new slaughterhouse is currently under construction and due to open in June. This will be using refurbished Dutch equipment.
- The limited number of slaughtering facilities and the ownership of these facilities by traders is leading to a high level of market power by traders in the value chain.

Fat rendering at Wambizzi



Dehairing of pork heads and trotters at Wambizzi



Overview – Veterinary system and diseases

Highly endemic African Swine Fever is causing major losses

- African Swine Fever (ASF) is highly endemic and rampant in the industry. It frequently wipes out entire herds of many farms in the country. There is currently no available vaccine against ASF and farmers are therefore dependent on biosecurity measures in the prevention.
- This is increasingly being recognized and farmers are imposing increasingly strict biosecurity measures. However, outbreaks still occur on a regular basis. Among small-scale farmers, biosecurity is poor.
- Animals suffering from ASF are still sold to other actors in the value chain, spreading the disease throughout the country. This is sometimes made possible by unprincipled veterinary officers, who clear animals unfit for slaughter.
- Other diseases and parasites such as gastrointestinal worms, mange mites, meningitis, malnutrition and anaemia among piglets are common.
- In general, hormones for synchronisation and vaccines are absent in Uganda. Antibiotics and other treatments such as de-wormers are available.
- Local vets are responsible for the veterinary services for farmers. Some also have a veterinary assistant on site. In general, these services were perceived as good. Independent testing labs, such as frequently mentioned by poultry stakeholders are not a priority to stakeholders. Makerere University has recently received new disease diagnostics equipment.

Common diseases	Mortality
African swine fever	70-100%
Anaemia	Death of piglets
Mange mits	Affects growth and meat quality
Gastrointestinal worms	Affects growth and meat quality
Meningitis	40-50%

Market developments – Key drivers for growth

Increasing demand and commercialization is driving sector growth, but critical value chain constraints remain

High demand

- Pork is one of the most popular proteins in Uganda, and consumption is increasing.
- Demand is growing faster than local production, providing a ready market for any increased production.
- There is an increased demand for lean, quality pork. Some pork joints are already selling lean pork for a higher price on the menu and indicate that this type of pork is in higher demand.

Increased investment and commercialization

- A number of key new players have or are investing in piggery production in Uganda. These are larger commercial operations, driving the standards up in the country. Other announced investments in slaughtering facilities can provide a major boost.
- Local investments in feed production, such as by Devenish Nutrition, is greatly benefiting the overall sector.
- There is a high level of interest for further investment and increased commercialization.

Underdeveloped premium market and value chain (constraint)

- Market prices for pig meat are still low in the country. There is a limited demand for quality products and the non-commercial nature of many pig farmers is keeping the prices artificially low.
- This is further aggravated by the delivery of free inputs such as piglets to farmers, as it undermines a business mindset. The market power of traders distorts the overall market, leading to low farmer profitability.
- This low price received by farmers and lack of premium demand is constraining market growth.

Major feed producers

Growing number of concentrate suppliers

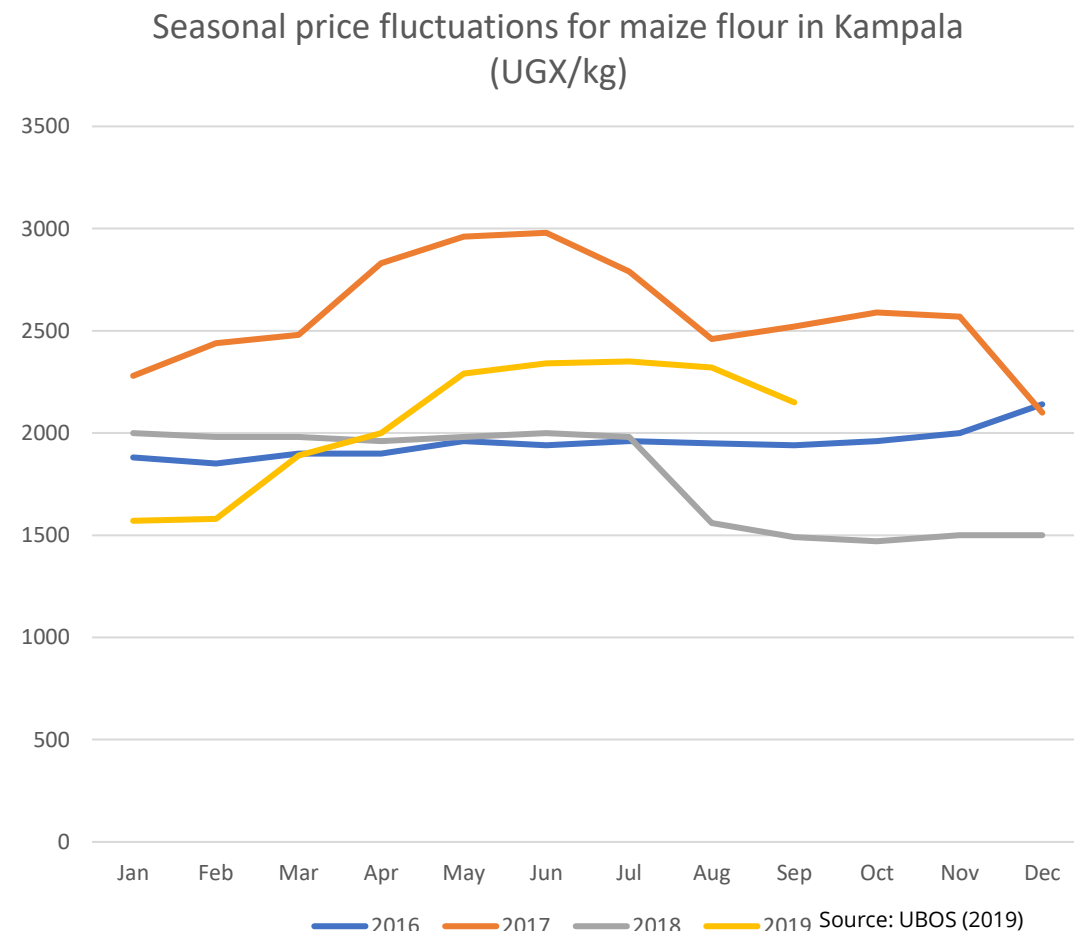
- Within Uganda, there is a **growing use of concentrates instead of pelleted feeds**. This is the result of distrust in the market of locally manufactured complete feeds due to a perceived low quality.
- This provides market opportunities for importers of concentrates. One of the first players in this market segment was Kaffiika, the Ugandan distributor of Koudijs concentrates. They currently lead the market, although a number of other European companies are supplying the Ugandan market. The complete feeds manufacturers also import their pre-mix from countries such as South-Africa, for example from DSM. As a result, the prices for feed in Uganda are highly dependent on the UGX/EUR exchange rate. **Local concentrate manufacturing would mitigate this risk and is currently being started by several players in the market.**
- Devenish Nutrition, an Irish feed supplier, has started a feed production plant in Hoima specifically geared towards pig feeds. This is coupled with a development programme and has allowed Devenish to secure a role as market leader in the complete pig feed market. Other feed companies are recognizing the growth of the pig industry and are trying to establish themselves in this growing market.

Producer	Species	Types of feed	Country of origin of feeds
Biyinzika	Pig & Poultry	Concentrate/complete pelleted feeds	Uganda
Yo kuku	Poultry	Complete pelleted feeds	Uganda
Uga chick	Pig & poultry	Complete pelleted feeds	Uganda
Impala feeds/AgroVet link	Pig & Poultry	Concentrate/ Complete pelleted feeds	Uganda/Ukraine (started with Dutch funding)
Kamp feed	Pig & Poultry	Complete pelleted feeds	Uganda
Champrisa/ Hendrix concentrates (Trouw Nutrition)	Pig & Poultry	Concentrates	The Netherlands
Nutristar/CCPA	Poultry	Concentrates	France
Jubaile Agrotec	Poultry	Concentrates	Nigeria
Conversion feeds/ Intraco	Poultry	Concentrates	Belgium
Kaffiika/ Koudijs	Pig & Poultry	Concentrates/Pre-mix/ Complete feeds	The Netherlands/Uganda
Devenish Nutrition	Pig	Pre-mix and complete feeds	Ireland/Uganda
Bulamu feeds	Pig	Complete feeds and pre-mix	Uganda

Seasonality of raw materials

Seasonality of maize prices is a key dynamic in the poultry value chain, dictating volume of production

- A key dynamic in the poultry market is the seasonality of the price of maize. **The price of maize fluctuates dramatically throughout the year**, with it also being a highly politicized product in Uganda.
- A high number of especially broiler farmers stock their houses when the maize prices are low, leading to a significant increase in production and thus a glut of produce on the market. This lowers the final price of the end product and oversupply. Moreover, as many exit the market during the period of higher prices, there is also a lack of supply during certain periods of the year.
- To capitalize on this seasonality of production, major DOC producers and DOC importers attempt to forecast the maize prices and adjust their production accordingly. As this forecasting is prone to error, it **often leads to over or undersupply of DOCs**.
- Similarly, investments in downstream facilities such as slaughterhouses become riskier, as there is no stable supply of produce.
- In order to stabilize their costs of inputs throughout the year, large integrators have already invested heavily in recent years in silo storage. Medium to large scale independent farmers have also already invested or are planning to invest in feed storage. This provides business opportunities for silo providers.
- This seasonality also affects piggery producers, although to a lesser degree given the longer lifespan of the animals. None of the breeding or finishing actors have yet invested in silo storage, but as one interviewee put it, “the first to put down silo’s for storage will be the king of the business”.

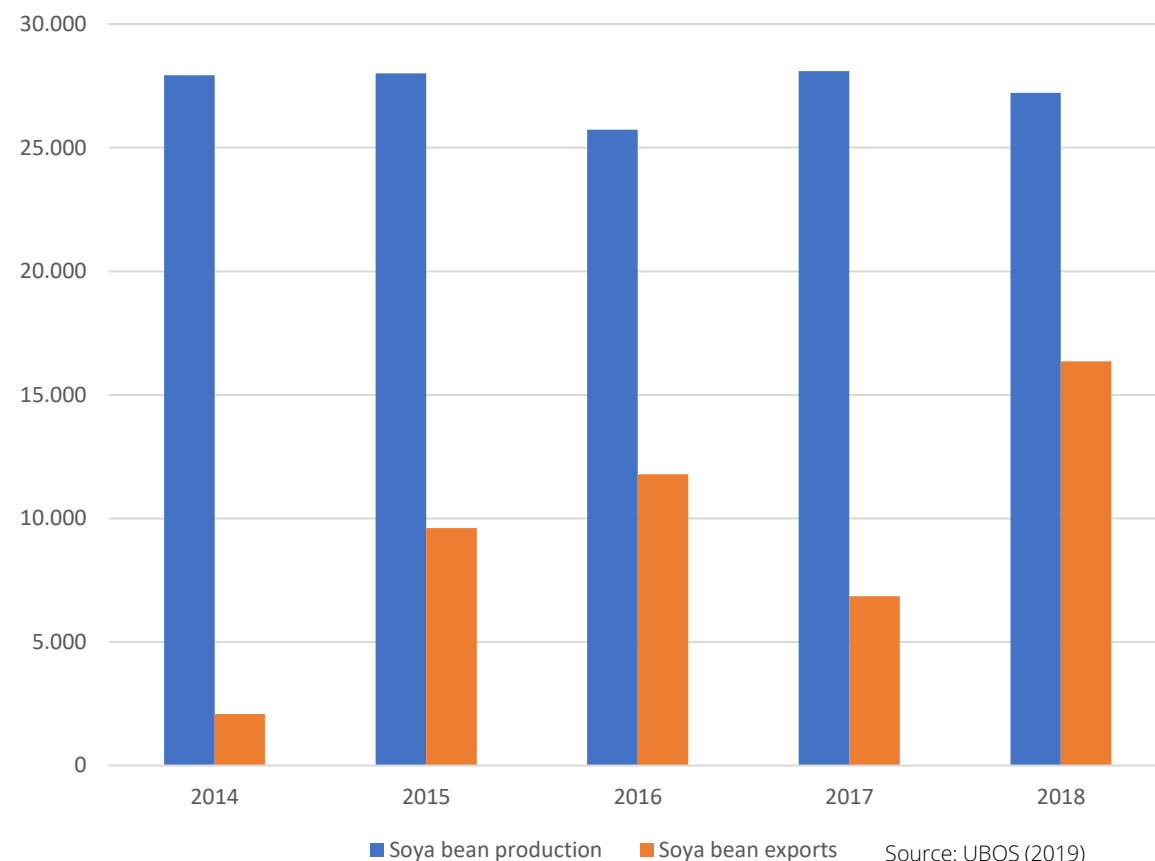


Availability of raw materials

Quality raw materials, especially proteins, are increasingly difficult and expensive to source

- Within both sectors, the supply and quality raw materials is mentioned as key constraints. Whereas **smaller players complain about low quality or adulterated feeds** (stones in the fishmeal), **large feed producers are mentioning the lack of quality and affordable maize** and especially the availability of affordable proteins. Soybeans, a primary protein input to poultry and pig feed, has become increasingly expensive in Uganda.
- While production has remained stable of the years, **demand for and exports of soybeans has increased significantly** in the last years. This is partly due to China increasingly sourcing soybeans from East-Africa as a result of the tariff war with the United States.
- Due to poor storage and production practices, **maize suffers from aflatoxin contamination**. Similar issues concerning low product quality because of storage and post harvest handling are there for silver cyprinid (mukene) as a protein source.

Increasing soy bean exports with stable overall production
(Metric tonnes)



Mapping of actors

Public sector

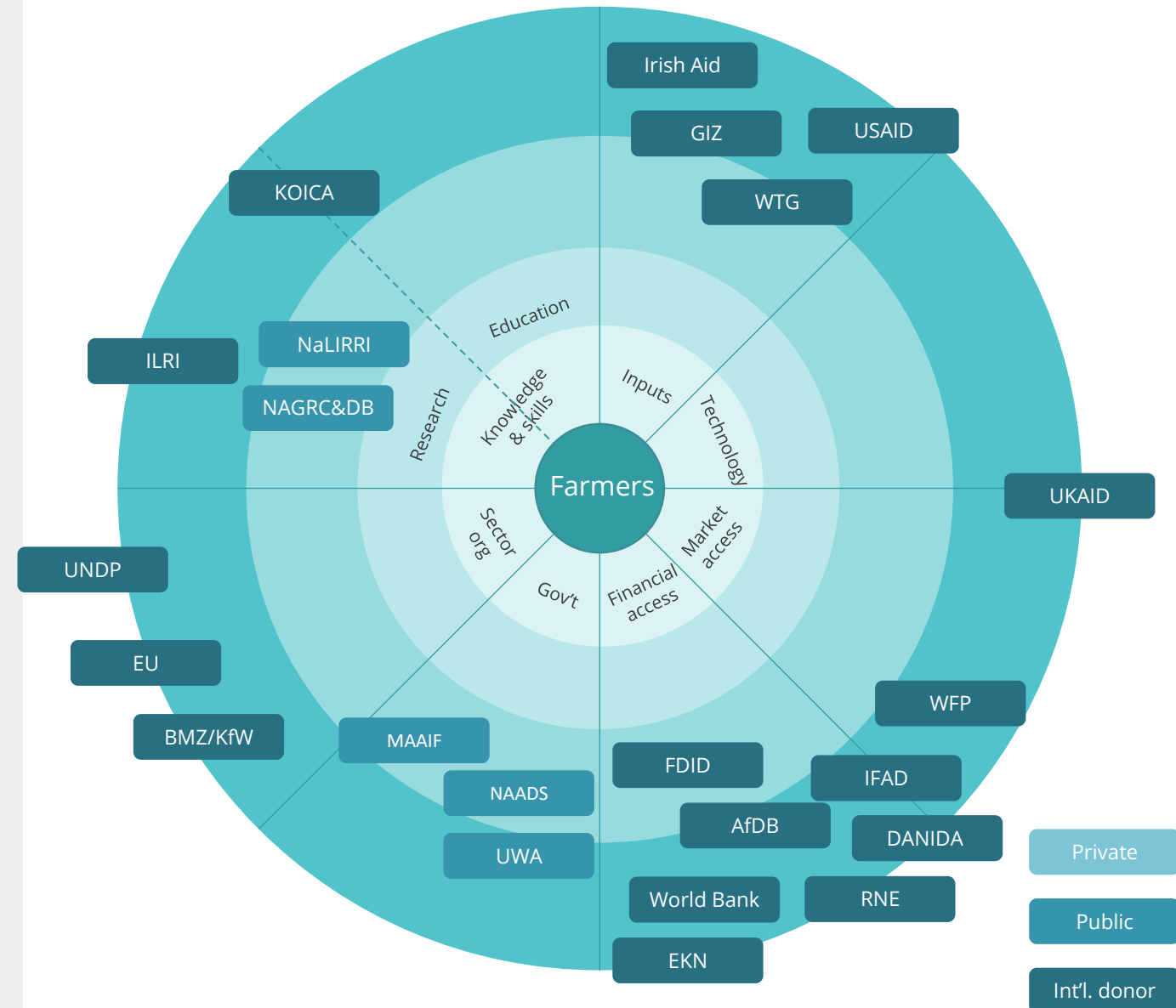
- The public sector has the potential to play a key role in the development of the sector. However, poultry and piggyery are both not governmental priorities.
- Universities and vocational training institutes lack practical and commercial-oriented knowledge and skills transfer capacity. Several donor-driven initiatives were identified. The initiatives mostly focus on research, knowledge and skill transfer, input improvement and introduction of best practices.

Private sector

- Promising private sector initiatives have been identified in Uganda. These companies are primarily commercial businesses but at the same time function as “light house” projects which serve as successful examples for the wider sector and disseminate best practices.
- International funding for private sector players, most notably Biyinzika and Breeds, Feeds and Meats Uganda, has transformed the sectors. Similar initiatives, such as the PSI support for Impala feeds or the DFID/AgDevCo support for a new commercial pig farm is still to have a major impact.

International Donors

- Several donor-driven initiatives were identified. The initiatives mostly focus on research, veterinary extension, financial access, knowledge and skill transfer, input improvement and introduction of best practices. **Education and technology in piggyery and poultry are underserved segments.**



Most relevant development projects

Project name	Donor partner	Implementing partners	Total budget (US\$)	Districts/Regions Covered	Project period
ILRI: Uganda pig value chain project to develop environmentally-sustainable, gender-inclusive intervention packages.	GIZ, ILRI, ICARDA, CIAT, SLU	Makerere University, NaLIRRI, MAAIF, NAGRC&DB, ISU-UP, Eco - ventures International, Farm Radio, VEDCO, VWB	Not defined	Kampala city spreading into Wakiso and Masaka districts	2019-2021
Improving farm income through agriculture and livestock circulation	KOICA	Makerere University	1.83 million	Wakiso	2018 – 2020
African Livestock Productivity and Health Advancement (ALPHA).	Bill and Melinda gates foundation	Zoetis	\$14.4M	Nakaseke district, Sembabule district	2020-2022
NU-TEC MD	UK DFID	AgDevCo, Mercy Corps, Palladium Group	\$23.9m	Northern Uganda	2014 - 2023
Sustainable Access to Poultry Parental Stock to Africa (SAPPSA)	Bill and Melinda gates foundation	Hendrix Genetics	\$8 mil	Nation wide	2019-2023
Devenish model pig farm in Hoima	Irish Aid	Devenish Nutrition	\$>1 mil	Hoima	2013 – now
East African Youth Inclusion Program (EAYIP)	MasterCard foundation	Heifer International	Not defined	East Africa	2016-2021
PigBoost	InnovateUK/DFID	AbacusBio, University of Edinburgh, Vetline Services, Makerere University	\$500.000	Mukono district	2020-2022
Vets United	Welttierschutzstiftung and Welttierschutzgesellschaft (WTG)	WTG, BAM Animal clinics, Makerere University	Not defined	Nation wide	ongoing

Most relevant development projects

Project name	Donor partner	Implementing partners	Total budget (US\$)	Districts/Regions Covered	Project period
Nakifuma farming company	AgDevCo/DFID	Centurion Agricultural Partners	2,600,000	Kampala	2019-
Skilling Youth for Employment In Agribusiness (SKY)	RNE, EKN	AVSI	13,734,399	<u>Central region</u> (Kampala, Wakiso, Kalungu, Mukono, Mityana, Nakaseke, Mpigi, Luwero) <u>Eastern region</u> (Iganga, Tororo, Mbale, Kapchorwa, Soroti, Kamuli, Jinja, Bugiri, Butaleja, Buikwe) <u>Western region</u> (Mbarara, Kabarole, Rukungiri, Sheema, Kabale, Bushenyi, Kamwenge, Kiruhura, Isingiro, Bunyangabu) <u>Lango sub-region</u> (Lira, Otuke)	2015-2020
Agriculture Cluster Development Project (ACDP)	World Bank	Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), participating districts, private sector	US\$ 150 million (equivalent) IDA credit	12 clusters, including Masaka, Mpigi, Rakai, Iganga, Bugiri, Namutamba, Pallisa, Tororo, Butaleja, Kapchorwa, Bukwo, Mbale, Soroti, Serere, Amuru/Nwoya, Gulu, Apac/Kole, Oyam, Lira/Dokolo, Kabarole, Kamwenge, Kasese, Kyenjojo/Kyegweg, Mubende, Kibaale, Hoima, Masindi/ Kiryandong, Ntungamo, Kabale, Bushenyi, Isingiro, Nebbi, Arua, Yumbe	2016-2022
Karamoja Resilience Support Unit	USAID	Tufts University	5 mln	Abim, Amudat, Kaabong, Kotido, Moroto, Nakapiripirit, Napak	2015-2019
Small and Medium Agribusiness Development Fund/Equity Fund	EU, NSSF	IFAD	EUR 16,2 MN	Nation wide	2014-2028
Support to the Strategic Plan of TradeMark East Africa Uganda Country Programme	DANIDA	Trademark East Africa (TMEA)	\$9.1 million	Nation wide	2019-2022
Agricultural Value Chains Development Programme (AVCD-1)	AfDB	Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)	5.2	38 districts across the country	2017-2023

Overview of support

Available RVO instruments for Private Sector Development

RVO instruments	Description
PSD Toolkit	The PSD Toolkit is a set of instruments available to the Embassy and RVO to develop small projects such as sector studies, small training programmes or for the formation of Public-Private Partnerships.
SDGP facility	<u>The SGDP facility</u> supports Public Private Partnerships that contribute to achieving the SDGs through a grant subsidy. This partnership should have at least one Dutch partner. The instrument is currently closed for applications.
Impact Cluster	The Impact Cluster is a RVO tool available for the development of integrated value chain clusters. An Impact Cluster is mutually designed by an Embassy, a consortium of Dutch and local businesses and RVO.
DHI	<u>The demonstration projects, feasibility studies and investment preparation studies (DHI)</u> is a subsidy for SMEs with international ambitions in emerging markets. Dutch companies can apply for subsidy for demonstration projects, feasibility studies or investment preparation projects.
FVO	The <u>Fund for Responsible Business</u> supports Dutch partnerships that wish to address the underlying causes of Responsible Business Conduct risks and misconduct in their value chains and implement measures to address them.
PIB	<u>Partners for International Business (PIB)</u> is a programme that allows Dutch businesses to enter into a public-private partnership to realise their international ambitions. This is primarily focussed on matchmaking, networking and economic diplomacy.
DGGF	<u>The Dutch Good Growth Fund (DGGF)</u> is set up to help Dutch entrepreneurs realise their international ambitions in emerging markets and developing countries (DGGF countries). The fund supports investment, import, export and investment funds.
Develop2Build	<u>Develop2Build (D2B)</u> is a Government-to-Government programme offering governments in 37 developing countries and emerging markets direct assistance in setting up infrastructural projects.
DRIVE	<u>DRIVE</u> facilitates investments in infrastructural projects that contribute towards a good business climate and entrepreneurship in the priority sectors: water, climate, food security, and sexual and reproductive health and rights (SRHR). Public infrastructure projects that have a high development relevance in other sectors also can apply for DRIVE support.
SIB vouchers	<u>SIB vouchers</u> can be used by Dutch businesses, to hire a consultant for market studies, participate in a trade mission or to hire an international lawyer.

Overview of support

Other Dutch organisations and tools

Other Dutch (funded) organizations or initiatives	
PUM	<u>PUM</u> is a volunteer organization of Dutch experts supporting businesses worldwide. 180 PUM representatives are spread over 35 countries across the globe, with 1700 experts being active in 45 sectors.
NUFFIC OKP	<p>The Knowledge Programme offers scholarships, training and institutional partnerships between education institutions in Technical and Vocational Education and Training (TVET) and higher education, in fields related to the priority themes of the Dutch government:</p> <ul style="list-style-type: none"> • Food and nutrition security • Water, energy and climate • Sexual and reproductive health and rights • Security and the rule of law <p>This is implemented through a number of calls, published on the website of <u>NUFFIC</u>.</p>
YEP Program	The <u>Young Expert Programme</u> allows young experts, both Dutch and local, in the Agro&Food sector to gain experience in an intercultural environment an work on a specific project related to either Water, Agrofood and/or Renewable Energy. Up to 50% of the salary of this young expert is subsidized by the Dutch Ministry of Foreign Affairs.
CBI	The <u>CBI</u> supports entrepreneurs to become successful exporters to the European market through export coaching projects.
Atradius Dutch State Business	<u>Atradius Dutch State Business</u> offers a wide range of insurance and guarantee products for Dutch exporters of capital goods, their financiers and/or investors. It also assist in finding other funding through the Dutch Good Growth Fund.
FMO	<u>FMO</u> is the Dutch entrepreneurial development bank. FMO manages funds for the Ministries of Foreign Affairs and Economic Affairs of the Dutch government to maximize the development impact of private sector investments.

Recommendations for further development

Introduction

The poultry and piggery sector are both rapidly growing and commercializing sectors within the country. Throughout this study, several key challenges, trends and opportunities have been identified. The following section will set out a key number of development opportunities, considering the strengths of the Dutch private sector and the priority themes of the EKN in Kampala.

A broader set of identified interventions have been summarized in Annex 2. Although the impact and effectiveness of these interventions is greatest when applied through an integrated approach, many can also be implemented independently. In the broadest sense, the proposed interventions contribute towards:

- Increased Food and Nutrition Security (FNS) through more resilient Food Systems.
- Increased Dutch-Ugandan investments and trade that is socially and environmentally responsible and contributing to inclusive growth.

These proposed development opportunities also align with the Sustainable Development Goals framework. Relevant SDGs and impact indicators have been added to the different development opportunities. To facilitate the implementation of these interventions, Dutch and Ugandan parties have been proposed. It also proposes RVO instruments where relevant for parties seeking support.

The following key development opportunities, in list of declining strategic priority, are proposed:

1. Improving the maize value chain;
2. Improving vocational livestock education;
3. Increasing production of alternative proteins for feed;
4. Improving locally available poultry genetics;
5. Investment in local feed production;
6. Promoting semi-intensive production for poultry farmers;
7. Leveraging slaughtering investment for piggery value chain development;
8. Promotion of nutritious and safe poultry products;
9. Improving locally available piggery genetics;
10. Key regulatory reform.



1. Improving the maize value chain

Storage of maize and promotion of the use of complete feeds will reduce seasonality

- The price of maize, being the main input for livestock feed in Uganda, is strongly fluctuating in line with harvesting seasons. In addition, poor storage practices and lack of storage capacity result in high levels of aflatoxin contaminations. As such, locally produced feed has a bad reputation. Farmers are therefore increasingly shifting towards the use of imported concentrates.
- Improving the quality of local complete feed production and simple independent testing, for example using innovative new Dutch handheld feed scanners, will improve the trust of farmers in the feed quality. The Dutch private sector can provide expertise and technologies in developing storage solutions, testing and training.

Storage:



By demonstrating the business case of quality storage, medium to large independent farmers can be convinced to invest in small storage units on farm. This is applicable for both maize farmers and poultry farmers. Smaller farmers can be grouped together to allow for the purchase of storage solutions or affordable small storage solutions such as hermetically sealed plastic bags or small silos.

Testing:



Establishing an independent feed testing lab that uses testing to indicate feed composition and quality. This lab facility and extension services can be coupled with information on feeding best practices.

Local feed production:

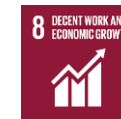
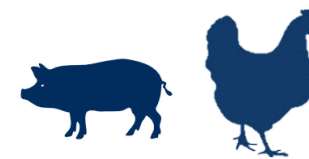


Improving local complete feed production through the demonstration of best practices, technology and storage solutions preferably at an established demonstration feed mill. Local feed producers can be trained in the Netherlands to the quality of local production.

Training:



Training of farmers on best feeding and storage practices, showing the benefits of the different types of feed (complete/concentrate/pre-mix) and how to optimally store feed and feed inputs.

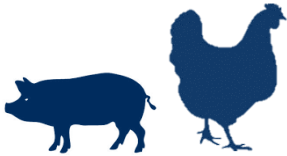
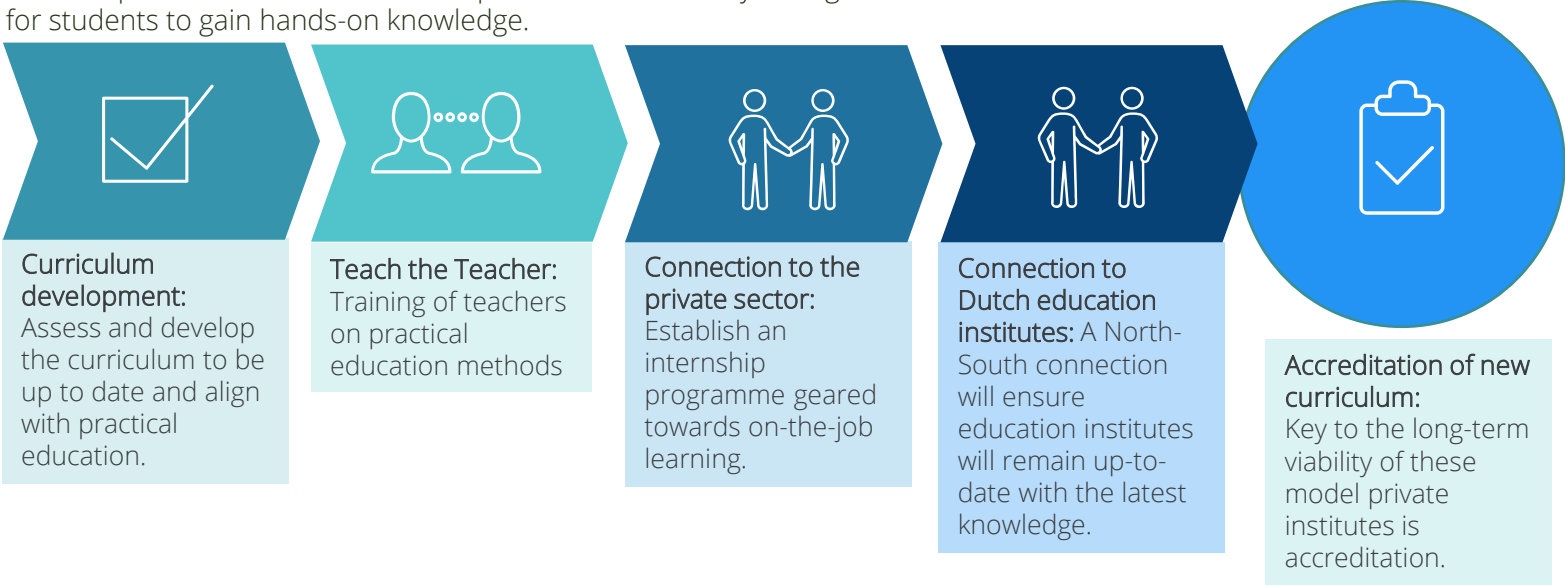


Potential implementing partners NL	De Heus, AgroCares, DSM, Big Dutchman Aeres, Agrifirm, Ottevanger.
Potential implementing partners UG	Ugandan private sector.
Suggested support tools	SDGP, Impact Cluster/DHI, PSD Toolkit (Pre-PPS funding).
Indicators	<p>Dutch-Ugandan Trade and Investment enhanced.</p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology <p>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</p> <ul style="list-style-type: none"> # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth). # of Ugandan companies ready to adopt Dutch technology. <p>Improved business climate for Dutch and Ugandan companies.</p> <ul style="list-style-type: none"> # of supported Dutch interventions in the local business environment for private sector development. Economic performance and resilience of farming systems increased. # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities.

2. Improving vocational livestock education

Drastic need for practically trained livestock staff

- In Uganda, there are only a few livestock and animal science education programmes. The content of these programmes is broad, with limited focus on either poultry or piggery. For example, poultry management is only taught as a minor course of the veterinary BSc programme. **In addition to strengthening the curriculum, the skills of the teachers also need to be geared towards practical education.**
- There is a high demand for trained practical staff, especially in the growing poultry sector. There are a number of mainly private initiatives that currently attempt to improve the vocational livestock education and have amongst others modelled their institutes on the Dutch educational approach. These are well-received by the private sector but are facing difficulties in getting their programme accredited. An example of such an institute is Seeta Institute of Animal Production and Management.
- Internships and connection with the private sector are key to align the education with the needs of the sector and for students to gain hands-on knowledge.

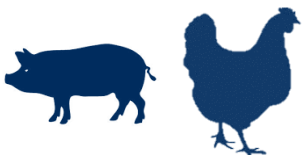
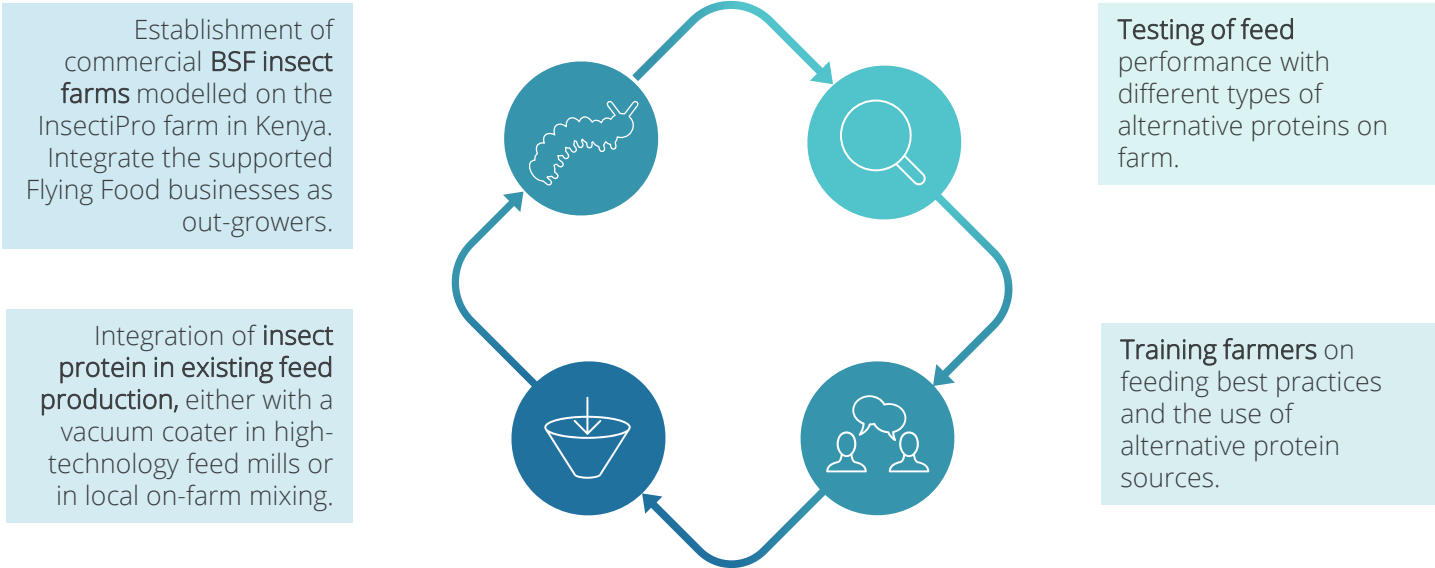


Potential implementing partners NL	Aeres, Van Hall Larenstein, Wageningen University, Dutch private sector.
Potential implementing partners UG	Seeta institute for Animal Production and Management, Makerere University, Ugandan private sector, National Council for Higher Education.
Suggested support tools	Orange Knowledge Programme Institutional Collaboration Projects
Indicators	<p>Economic performance and resilience of farming systems increased.</p> <ul style="list-style-type: none"> • # of farmers with increased productivity/income. • # of farmers with improved access to services. • # of farmers more resilient to shocks. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none"> • # of jobs created in agro food sector. • # of value chains/sectors perform better. <p>Quality of knowledge innovations systems for FNS.</p> <ul style="list-style-type: none"> • # of farmers that adopted research results/ knowledge/new technologies • # of FNS knowledge institutions that perform better.

3. Increasing production of alternative proteins for feed

Alternative protein sources to soybeans

- Soybean as a protein input for feed production is becoming less available and more expensive. As proteins are a key input to feed, **affordable and quality local protein is key to local feed sector development**. It will also allow local farmers to use pre-mixes instead of concentrates, necessitating fewer imports. Developing alternative protein value chains will have a wider impact, also on other rapidly growing sectors such as aquaculture and overall sustainability.
- Two alternative proteins are likely candidates. One approach would be to improve the **quality of locally available fishmeal**. However, given the importance of small fish such as mukene in the local food supply, this is likely to be problematized. Another would be to **develop a local insect-based circular protein industry**. This could build on the work and lessons learned of the Flying Food project. In order to be viable, this production should be at a larger, commercial scale level. An example of a regionally successful commercial farm is InsectiPro from Kenya. Collaboration can be sought with the insect-based feed Impact Cluster in Kenya, of which InsectiPro is a key partner. These and **specialized Dutch Black Soldier Fly (BSF) consultancy companies such as ProEnto** could assist with the establishment of the first **commercial BSF farm** in Uganda.



Potential implementing partners NL	Pro-ento, Protix, Mavitec, DSM, Ottevanger, Insectipro, Almex, De Heus, Trouw Nutrition, Aeres, Wageningen University.
Potential implementing partners UG	Ugandan private sector, Biyinzika, Devenish nutrition, Impala feeds, Yo Kuku, Kaffiika feeds
Suggested support tools	SDGP, FVO, EKN, AgDevCo
Indicators	<p>Dutch-Ugandan Trade and Investment enhanced.</p> <ul style="list-style-type: none">• # of Dutch companies doing business in Ugandan market (investment and trade)• The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade)• # of Ugandan companies using Dutch technology <p>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</p> <ul style="list-style-type: none">• # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth).• # of Ugandan companies ready to adopt Dutch technology. <p>Improved business climate for Dutch and Ugandan companies.</p> <ul style="list-style-type: none">• # of supported Dutch interventions in the local business environment for private sector development.• Economic performance and resilience of farming systems increased.• # of farmers with increased productivity/income.• # of farmers with improved access to services.• # of farmers more resilient to shocks. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none">• # of jobs created in agro food sector.• # of value chains/sectors perform better.• # of businesses co-investing in FNS activities.

4. Improving locally available poultry genetics

Establishing a local Grand Parent farm and Sasso chicken parent farms

- There are currently **no Grand Parent (GP) farms in Uganda**. This means that the poultry actors have to import their parent stock from other African countries such as Zambia or South Africa or further from Europe or India. **This results in higher costs and unreliability of supply**. It can take several months to bring in a new parent stock, during which production has to be halted in the case of a disease outbreak and **the current COVID-19 outbreak** shows the fragility of international supply chains and need for local production.
- **Interventions that promote the availability of quality local genetic material would greatly benefit the sector.** For the commercial sector, this would be the establishment of a GPS farm in Uganda. Regionally, the market is currently being served from Zambia, with other regional major regional players such as Tanbreed and KenChick also importing from sister operations from this country. Although the Ugandan market is still relatively small for a domestic GP farm and other constraints such as limited available trained labour pose a challenge, the growth rate of the main local players, the growing demand and the position of Uganda as lowest-cost producer in the EAC provides a long-term business opportunity.
- **For the smaller farmers, the promotion of the Sasso chicken and establishment of a parent farm can increase access to quality genetic material.** The eggs for this bird are being imported from Tanzania and Rwanda, with there being no parent stocks in Uganda yet. Establishing a parent farm would similarly reduce the import dependency and transport costs.



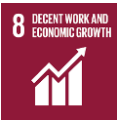
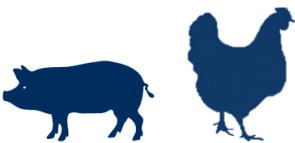
Potential implementing partners	Hendrix Genetics, Pas Reform, HatchTech.
Potential implementing partners UG	Local private sector
Suggested support tools	FMO, BMGF
Indicators	B2B



5. Investment in local feed production

Business opportunities in local feed production of concentrates and complete pig feed

- Both the poultry and piggery sectors are rapidly expanding, with there being a limited supply of especially locally manufactured complete pig feed. There is currently only one high-quality producer in the market, with others mainly supplying concentrates. Local production is key to long-term sustainable growth, as the fragility of international supply chains has been shown with the COVID-19 outbreak
- In general, there is a clear and increasing trend towards the use of concentrates in the sector. However, the imports of concentrates is a cumbersome process that is subject to exchange rate risks. Investments in local concentrate manufacturing, potentially combined with development opportunity #4 (Increasing production of alternative proteins for feed), provides a business opportunity. Investments by smaller players such as Impala Feeds have not managed to capture significant market share. Investments in feed production in Uganda need to be coupled with investments in last mile distribution or combined with a strong pre-existing distribution network. This investment in a feed facility can be combined with an aquafeed line, as there is currently also no high-quality aquafeed production in the country.
- As Uganda has a high domestic production of maize and thus relatively low maize prices, it is well-positioned to become a regional leader in feed production.



Potential implementing partners NL	De Heus, Trouw Nutrition, ForFarmers, AgriFirm
Potential implementing partners UG	Ugandan private feed players
Suggested support tools	FMO
Indicators	B2B



6. Promoting semi-intensive production for poultry farmers

Demonstrating Dutch technology and expertise to medium and large-scale poultry farmers



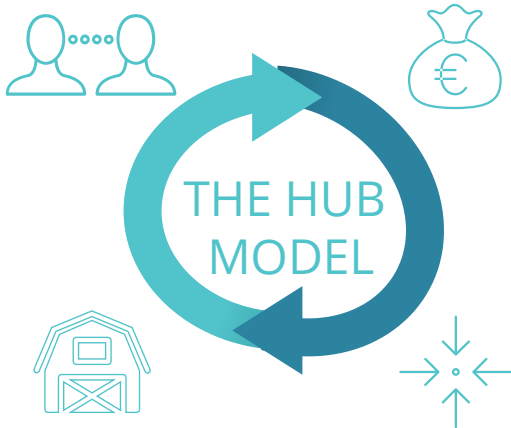
- **Independent mid-sized farmers have been identified as a specific target group with high growth.** Although these farmers have a significant number of birds, they are still operating at a relatively low technological level and with a high disease prevalence. Moreover, farm management practices knowledge are inadequate, resulting in low levels of biosecurity, improper medicine application (such as high levels of antibiotic usage).
- **The application of more enhanced production technologies** such as automatic feeders, ventilators, heating and storage for ingredients (maize silos) **will have a significant positive effect on farm productivity.** This will allow these medium- to large farms to better compete with the large integrators. In addition, this offers business opportunities for the Dutch private sector. For sustainability of the project, it is key that any demonstration is private sector driven and established at an existing commercial poultry farm.

Capacity building and knowledge transfer:

Training of farmers on equipment applicable for semi-intensive farming conditions, biosecurity, farm management and proper usage of medication (including reduction of antibiotics). This will allow farmers to realize a better technical performance.

Demonstration:

Demonstrating the technical and commercial viability of semi-intensive production systems; showcasing different forms of affordable, modular Dutch poultry technology.



Access to finance:

Inclusion of financial institutions providing capital for investments and work capital.

Aggregating of farmers:

Grouping of medium scale farmers to collectively purchase more expensive but essential hardware such as maize silos.

Potential implementing partners NL	Impex, De Heus, DSM, Hato, Kanters, Marel Poultry, Mavitec, Moba, Trouw Nutrition, Van Aarsen, Hendrix Genetics, Aeres, AgriWallet, Rabobank, FMO, Financial Access.
Potential implementing partners UG	Ugandan private sector, dFCU bank, Uganda development bank.
Suggested support tools	EKN, Impact Cluster, PSD Toolkit (Pre-PPS funding), YEP Program.
Indicators	<p>Dutch-Ugandan Trade and Investment enhanced.</p> <ul style="list-style-type: none">• # of Dutch companies doing business in Ugandan market (investment and trade)• The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade)• # of Ugandan companies using Dutch technology• # of jobs created by the Dutch private sector in Uganda <p>Corporate Social Responsibility among (Dutch) companies is enhanced.</p> <ul style="list-style-type: none">• # of Dutch companies with increased awareness and integration of international standards for CSR, including 'living wages'. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none">• # of jobs created in agro food sector.• # of value chains/sectors perform better.• # of businesses co-investing in FNS activities. <p>Quality of knowledge innovations systems for FNS increased.</p> <ul style="list-style-type: none">• # of farmers that adopted research results/ knowledge/new technologies

7. Leveraging slaughterhouse investment for piggery value chain development

Improving quality of production and increasing demand for quality pork products



- The investment in a slaughtering facility by **MAP Co. Ltd.** has the potential to be a key driver in sector development and improved food safety of pork in the country. However, **a high-technology slaughtering facility will only be successful if there is sufficient supply and demand for quality product.** Therefore, this private sector investment can be leveraged with an **integrated value chain approach** to overcome critical constraints and support further sector development by improving supply and demand for quality products.
- The demand for a quality product supports a better business case for pork joints and retailers. High-quality, lean meat requires less trimming and leads to higher usable carcass yield. However, many of the retailers are not aware of the **economic benefits of using quality, lean carcasses for pork joints.**



Potential implementing partners NL	AgriTerra, CBI, PUM, Marel Meat, Meyn, Celtic Cooling, Bolidt.
Potential implementing partners UG	MAP Co Ltd., pork joints, other Ugandan private sector.
Suggested support tools	EKN, international donors support.
Indicators	<div>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</div> <div><ul style="list-style-type: none"># of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth).# of Ugandan companies ready to adopt Dutch technology.</div> <div>Improved business climate for Dutch and Ugandan companies.</div> <div><ul style="list-style-type: none"># of supported Dutch interventions in the local business environment for private sector development.Economic performance and resilience of farming systems increased.# of farmers with increased productivity/income.# of farmers with improved access to services.# of farmers more resilient to shocks.</div> <div>Quality of private sector development for FNS increased.</div> <div><ul style="list-style-type: none"># of jobs created in agro food sector.# of value chains/sectors perform better.# of businesses co-investing in FNS activities.</div>

8. Promotion of nutritious and safe animal products

Growth of the domestic market for quality poultry and pig products

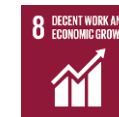
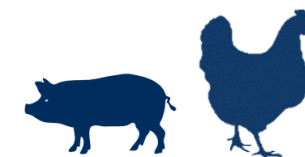
- Albeit growing, overall **egg consumption in Uganda is still relatively low compared to other emerging markets**. Eggs produced by the major companies in the country are predominantly exported as prices are higher in neighbouring East-African countries. However, as the freedom of trade in poultry products within East Africa highly fluctuates, **a stronger domestic market is key for long-term sector development**.
- Similarly, there is still a **low level of awareness of the food safety benefits** of frozen or processed animal products. The current unhygienic slaughtering practices on wet markets, both in poultry and pork, are a risk to public health and do not meet international standards in terms of animal welfare. **Promotion of frozen or processed foods will increase demand for quality products in the market**.
- A key intervention to support the development of the sector would thus be an awareness campaign for safe and nutritious animal protein products. This aligns with the needs of the growing middle class, who are increasingly receptive to such messages.
 1. Awareness campaigns that stimulate the consumption of safe and nutritious food such as the promotion of eating eggs in schools or an egg festival, such as the “Ayam Dan Telur” festival in Indonesia. This festival can be build around the Rolex chapati.
 2. Promoting the safety benefits of frozen foods and the setting of standards by the government for products used for the public institutions such as the army or hospitals. Fast food chains can also be a partner, as they are a key driver for higher standards in Uganda. Fast food chains have to meet standards set by the parent company. These needs are preferably met through local supply as this lowers risk and dependency on imports.



Awareness campaign for safe and nutritious animal protein products.



Development of a domestic market for quality poultry and pig products

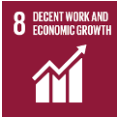


Potential implementing partners NL	Marketing company, PUM
Potential implementing partners UG	UG government, KFC, primary schools
Suggested support tools	PSD Toolkit
Indicators	<p>Peoples’ nutrition improved.</p> <ul style="list-style-type: none"> • # of people with improved food intake. • # of people with improved access to healthy/diverse food. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none"> • # of jobs created in agro food sector. • # of value chains/sectors perform better. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none"> • # of value chains/sectors perform better. • # of businesses co-investing in FNS activities. <p>Quality of governance for FNS increased.</p> <ul style="list-style-type: none"> • # of improvements in implementation of major national FNS policies/laws.

9. Improving locally available piggery genetics

Establishing a national breeders register

- **There is a lack of available high-quality piggery genetic material in Uganda.** Although there are numerous actors proclaiming to sell quality genetics, only two were identified in this study to sell quality genetic material. These also invested in keeping their genetic material at a high level through the importation of replacement genetics. There are currently no Dutch genetics locally sold on the market, although a new player using Dutch genetics is establishing themselves.
- However, the actors on the market currently supplying high-quality genetic material or that are intending to sell high-quality material **face the constraint of a lack of quality recognition in the market.** There is a surplus of low-quality breeders in the country, with no method or certification for the consumers to identify those breeders providing high quality genetics. As a result of this information asymmetry, the general quality of genetics on the market is low.
- To stimulate the local production and thus availability of quality genetics in Uganda, a solution is needed to overcome this information asymmetry. A frequently touted solution by stakeholders is the **establishment of a national breeders database**, that independently identifies the quality of breeders in the country. This would allow farmers to identify high-quality producers and source accordingly. It would also promote investment by local producers in high-quality genetics, allowing for Dutch business opportunities.
- A **register of quality breeders** will increase the **visibility of quality producers** in the country and will **allow consumers to identify and reliably buy quality genetics**. This stimulates the overall development of the sector and positively impact the investments made by local producers in the value chain. It will also create business opportunities for Dutch providers of breeding animals. As at the moment the majority of piglets are not sold and many breeders are not profitable, there is a need for consolidation in the market to increase efficiency.



Potential implementing partners NL	NVWA, Hendrix Genetics, Topigs Norsvin
Potential implementing partners UG	NAGRC & DB, MAAIF
Suggested support tools	EKN, international donor support.
Indicators	<p>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</p> <ul style="list-style-type: none">• # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth).• # of Ugandan companies ready to adopt Dutch technology. <p>Improved business climate for Dutch and Ugandan companies.</p> <ul style="list-style-type: none">• # of supported Dutch interventions in the local business environment for private sector development.• Economic performance and resilience of farming systems increased.• # of farmers with increased productivity/income.• # of farmers with improved access to services.• # of farmers more resilient to shocks. <p>Quality of private sector development for FNS increased.</p> <ul style="list-style-type: none">• # of jobs created in agro food sector.• # of value chains/sectors perform better.• # of businesses co-investing in FNS activities.

10. Key regulatory reform

Key G2G interventions could greatly benefit sector development.

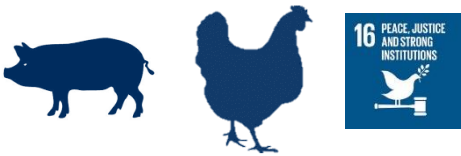
➤ There are a number of key regulatory interventions that would greatly benefit the sector and could promote future Dutch private sector involvement. The EKN can work with the MAAIF for a full regulatory review and assessment of the impact of the new Veterinary Drugs and Feeds bill on Dutch private sector involvement.

Key elements to review are:

- The long importation time for vaccines, premixes and concentrates.
- Tackling fake or adulterated veterinary supplies on the market by supporting the implementation of the new bill.
- Reviewing the law against the nightly transport of pigs.
- Implementing standards on health and food safety, with special emphasis on restricting wet markets.



Legislatory review and impact assessment and potential implementation support of the new Veterinary Drugs and Feeds bill.



Potential implementing partners NL	EKN, NWWA, MinLNV
Potential implementing partners UG	MAAIF
Suggested support tools	G2G
Indicators	<p>Improved business climate for Dutch and Ugandan companies.</p> <ul style="list-style-type: none">• # of supported Dutch interventions in the local business environment for private sector development.• The time and money needed to import goods to and export goods from Uganda is reduced.• # of projects that can be developed and tendered based on value for money principles (with possibly the involvement of Dutch companies in the process). <p>Quality of governance for FNS increased.</p> <ul style="list-style-type: none">• # of Improvements in implementation of major national FNS policies/laws.• # of FNS knowledge institutions that perform better.



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Annex 1

Export and import duties of poultry (production) related products in percentages

HS Code	Description	EAC common tariff rates
0105.11.90	Live Fowls Gallus, Domesticus<=185g, Excl. Parent Stock Of One Day Chick	0%
0105.11.10	Fowls Of The Species Gallus Domestic(Parent Stock One Day Chick)	0%
0105.94.00	Fowls of the species Gallus domesticus	25%
1602.39.00	Preparations Of Poultry (Excl. turkey/fowls Of Species Gallus Domesticus)	25%
8436.21.00	Poultry Incubators And Brooders	0%
8438.50.00	Machinery For The Preparation Of Meat Or Poultry	0%
8436.29.00	Other Poultry-Keeping Machinery	0%

Annex 1

Export and import duties of piggery (production) related products in percentages

HS Code	Description	EAC common tariff rates
0103.10.00	Live Swine -- Pure-bred breeding animals	0%
0103.91.00	Live Swine -- Weighing less than 50 kg	25%
0103.92.00	Live Swine -- Weighing 50 kg or more	25%
1602.41.00	Preparations Of Swine (Excl. turkey/fowls Of Species Gallus Domesticus)	25%
8438.50.00	Machinery For The Preparation Of Meat Or Poultry	0%

Annex 1

Export and import duties of feed (production) related products in percentages

HS Code	Description	EAC common tariff rates
8436.10.00	Machinery For Preparing Animal Feeding Stuffs	0%
2304.00.00	Oil-cake and other solid residues whether or not ground or in the form of pellets, resulting from the extraction of soya-bean oil	10%
2303.30.00	Brewing or distilling dregs and waste	10%
2303.10.00	Residues of starch manufacture and similar residues	10%
2306.90.00	Oil-Cake And Other Solid Residues, Of Other Vegetable Fats And Oils (Fishmeal)	10%
2308.00.00	Vegetable materials and vegetable waste, vegetable residues and byproducts, whether or not in the form of pellets, of a kind used in animal feeding, not elsewhere specified or included.	10%
2309.90.10	Premixes used in the manufacture of animal and poultry feeds	0%
3002.30.00	Vaccines for veterinary medicine	0%

Annex 1

Export and import duties of exemptions

Imported inputs by persons engaged in horticulture, agriculture or floriculture and aquaculture sector e.g. hatching eggs, day old chicks, semen, fish eggs, Fry / fingerling (young fish), seeds, green houses/ materials used in construction of green houses, flower cuttings, incubators, hatcheries etc.	Exempted from all taxes when imported by persons engaged in horticulture, agriculture, aquaculture or floriculture under the 5th Schedule of the East African Community Customs Management Act, 2004.
Cold Rooms A cold a room in which a low temperature is maintained (as for refrigeration)	Import Duty is 0% in accordance with the EAC CET. Helps on post harvest management and cold chain storage of agricultural products such beef, chicken, fish etc
Poultry parent stock imported by persons engaged in poultry farming. A broiler and layer breeder farms raise parent stock which produce fertilized eggs. A broiler/layer hatching egg is never sold in shops and is not meant for human consumption but for hatching into day old chicks.	VAT Exempted when imported by dealers under the VAT Act. • Exempted from all taxes when imported by persons engaged in agriculture under the 5th Schedule of the East African Community Customs Management Act, 2004.
Breeding animals. Breeding stock is a group of animals used for the purpose of planned breeding	VAT Exempted when imported by dealers under the VAT Act. • Exempted from all taxes when imported by persons engaged in agriculture under the 5th Schedule of the East African Community Customs Management Act, 2004.
Feeds for Poultry and Livestock Poultry Feed is food for farm poultry, including chickens, ducks, geese and other domestic birds. Modern feeds for poultry consists largely of grain, protein supplements such as soybean oil meal, mineral supplements, and vitamin supplements	VAT Exempted when imported by dealers under the VAT Act. • Exempted from all taxes when imported by persons engaged in agriculture under the 5th Schedule of the East African Community Customs Management Act, 2004.
Veterinary Chemicals (Acaricides)	VAT Exempted when imported by dealers under the VAT Act. • Exempted from all taxes when imported by persons engaged in agriculture under the 5th Schedule of the East African Community Customs Management Act, 2004.

Educational interventions (1)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Perception	<ul style="list-style-type: none"> Education in Uganda is primarily geared towards larger types of livestock. This is the result from tradition and historical approaches to animal keeping and therefore there is little value associated with poultry and piggery segments. Traditionally, men take care of cows, women take care of poultry. It is therefore an additional income source, not the main one. 	<ul style="list-style-type: none"> In order to professionalize the sectors, the educational programmes need to align with the modern approaches to poultry and piggery. It will be essential for the government through its educational programmes to show the value in these segments, especially when professional practices are introduced. This can be done through examples of successful entrepreneurs. Or for example by illustrating the large demand for skilled labour, both for the daily activities and management. 	<ul style="list-style-type: none"> By improving the perception of different forms of income sources, the sector will be taken more seriously. This is essential to pave the way to a more professional sector. Other spin-offs could include breaking some gender barriers. 	<p><i>Economic performance and resilience of farming systems increased.</i></p> <ul style="list-style-type: none"> # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better.
Content	<ul style="list-style-type: none"> There are only a few livestock and animal science programmes. The content of programmes is very broad, with little focus on either poultry or piggery. Poultry, for example, is an additional subject that is part of a larger veterinary education at BSc level. 	<ul style="list-style-type: none"> The programmes will need to include more segment specific modules. This will allow entrepreneurs in the sector to professionalize their practices and rely less on the academies offered by the private sector. The intervention should focus mostly on the vocational level and BSc levels for poultry. 	<ul style="list-style-type: none"> When local companies can obtain expert advice, or highly skilled labour locally, this will increase the security for job seekers. Furthermore it will allow farmers to improve their operations at a lower cost whilst also improving their profitability. 	<p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/ knowledge/new technologies # of FNS knowledge institutions that perform better.
Teaching method	<ul style="list-style-type: none"> The structure of the programmes is currently highly theoretical. Especially at vocational level, but also at BSc level it is essential to observe the theory in practice. Meaning that even if entrepreneurs can obtain education with content catered to the specific sector, there is a large gap between the theory and practice. 	<ul style="list-style-type: none"> Educators will need to know how to integrate practical lessons in the programme and keep up with recent developments. This is so important to fully develop the skills and embed the theoretical knowledge through practice. Provide guidance on teaching methods and show the potential how people can make the best use of these materials. For example, the classes that the educator work with must be in smaller groups. 	<ul style="list-style-type: none"> The programmes become enriched through the integration of practical teaching. With such elements entrepreneurs have more certainty that the experts that they are seeking truly understand the practical implications of their work. This will allow for more valuable employees, more effective work and in turn better practices. 	

Educational interventions (2)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Internships	<ul style="list-style-type: none"> Internships are already being used for students to become acquainted with the practical side of their field of study. However these are not done extensively enough. An additional issue is that when students do get access to companies, then the work is often research focused instead of practical application focused. 	<ul style="list-style-type: none"> Practical training does not only need to be offered by the education institutes. A strong collaboration with the private sector is an effective vehicle to allow students to obtain practical experience. The government needs to encourage the private sector to offer internships. This can be achieved both locally as well as internationally, for example in collaboration with EKN and the Dutch private sector players. 	<ul style="list-style-type: none"> The programmes become enriched through the integration of practical internships. With such elements entrepreneurs have more certainty that the experts that they are seeking truly understand the practical implications of their work. This will allow for more valuable employees, more effective work and in turn better practices. 	<p><i>Economic performance and resilience of farming systems increased.</i></p> <ul style="list-style-type: none"> # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p>
Government	<ul style="list-style-type: none"> For any of these suggestions to be successful the ministry of education needs to be involved. This is the governmental body that determines the type of programmes that are available. 	<ul style="list-style-type: none"> In practice it is not recommended to completely re-arrange any programme. As it will be difficult to achieve success, which is often measured according to the accreditation of such programme. Instead it is better to gradually adjust certain elements. Any intervention should ensure accreditation is achieved before finalizing a project. Because these programmes will only hold value if they are certified at national level. Interventions should first be geared towards poultry for both broilers and layers. Piggery is too underdeveloped and often poorly managed. So while big strides can be achieved in piggery, it is better to focus first of effective production in poultry. Initiatives could be set up through Nuffic programmes. 	<ul style="list-style-type: none"> For students there will be more added value to their education, ensuring them that they have all necessary skills to be a valuable employee. For entrepreneurs it means that they have more access to local expertise, making them less dependent on foreign experts who are also very expensive. This is paramount for the development of small-medium enterprises who will benefit from these changes the most. In the collaborative effort best practices can continuously be developed and implemented making production more efficient. 	<ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. <p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/knowledge/new technologies # of FNS knowledge institutions that perform better. <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.
Partnerships	<ul style="list-style-type: none"> When creating partnerships to develop programmes, experience has shown that strong collaboration is essential. Often there is a mismatch between the responsibilities of partners. As financial incentives do not always ensure that the necessary developments are implemented. Therefore equal buy in from all partners is required to ensure continuity. 	<ul style="list-style-type: none"> Programmes can also be developed in collaboration with private training institutions as they are often highly effective. An alternative solution would be to work with sector associations such as poultry association. These will enable programme developers to truly focus on emerging farmers that are not too big, but also not too small. Aeres is one of the few dedicated experts who can specifically look at a curriculum, assess the need of the market and ensure the program offers the right information. Such an intervention can be addressed through an institutional partnership. It starts with a survey for what is required in the market in collaboration with companies. Then in collaboration with institution the curriculum can be build from there. 		

Supply side interventions (1)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Genetics - poultry	<ul style="list-style-type: none"> There is a clear lack of high-quality genetic material in the country. The supply and quality of available DOC's fluctuate dramatically, with the sale of diseased DOC's being a common occurrence. There are currently no Grand Parent Farms (GPS) in Uganda. This means that the poultry actors have to import their parent stock. Moreover, the high transport costs prevent smaller local players in their ability to enter the breeding market. As well, the high transport costs and long supply time combined with the lack of regulation and health control also incentivizes local players to retain their diseased flock and sell diseased DOCs. 	<ul style="list-style-type: none"> Interventions that promote the availability of quality local genetic material would greatly benefit the sector. For the larger commercial players, this would be the establishment of a GPS farm in Uganda.. Although the Ugandan market is still relatively small for a GPS farm and other constraints such as a lack of trained labour would make it difficult to establish, the growth rate of the main local players, the strong domestic demand and the position of Uganda as a member of the EAC results in a high potential. 	<ul style="list-style-type: none"> By improving the availability of genetic material, farm productivity and profitability would greatly increase in the country. Lower supply times and transport costs would lead to better operational profits. This will help them to become more financially independent and invest in other parts of their business 	<p><i>Dutch-Ugandan Trade and Investment enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology <p><i>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</i></p> <ul style="list-style-type: none"> # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth). # of Ugandan companies ready to adopt Dutch technology. <p><i>Improved business climate for Dutch and Ugandan companies.</i></p>
Genetics - piggery	<ul style="list-style-type: none"> There is also a lack of available high-quality genetic material in Uganda. The current suppliers of high-quality genetic material or those intending to sell high-quality material face the constraint of a lack of quality recognition in the market. There is a surplus of low-quality breeders in the country, with no method or certification for the consumers to identify those breeders providing high quality genetics. 	<ul style="list-style-type: none"> To stimulate the local production and thus availability of quality genetics in Uganda, a solution is needed to overcome this information asymmetry. A frequently touted solution by stakeholders is the establishment of a national breeders database, that independently identifies the quality of breeders in the country. This would allow farmers to identify high-quality producers and source accordingly. It would also promote investment by local producers in high-quality genetics, allowing for Dutch business opportunities. 	<ul style="list-style-type: none"> A register of quality breeders will increase the visibility of quality producers in the country and will allow consumers to identify and reliably buy quality genetics. This stimulates the overall development of the sector and positively impact the investments made by local producers in the value chain. It will also create business opportunities for Dutch providers of breeding animals. 	<ul style="list-style-type: none"> # of supported Dutch interventions in the local business environment for private sector development. Economic performance and resilience of farming systems increased. # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p>
Genetics - general	<ul style="list-style-type: none"> Smaller farmers in Uganda are currently lacking stable access to high quality inputs and are dependent on the large integrated players, with whom they directly compete on the end-market. Due to the high transport costs, they are not able to afford to import parent stock, import pig genetics or otherwise access high quality genetic inputs. 	<ul style="list-style-type: none"> This could be solved by the grouping of farmers in cooperatives or through producer associations. As a result, farmers can benefit from collective access to inputs and markets. Key to a successful project involving cooperatives is to have a focussed approach, with a high level of technical assistance for a limited number of cooperatives. 	<ul style="list-style-type: none"> By enabling smaller farmers to collectively purchase their inputs, it will lower their production costs. Moreover, grouping of farmers would also allow them to invest in their own breeding animals. This will help them to become more financially independent and invest in other parts of their business. 	<ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities.

Supply side interventions (2)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Feed production	<ul style="list-style-type: none"> Feed in Uganda is very expensive. This is one of the main barriers for farmers that needs to be addressed in order to improve their profitability. The potential for local feed production is large and could lead to a reduction in input costs for farmers. Farmers often cannot afford proper storage facilities, they are at the mercy of the maize price fluctuations. 	<ul style="list-style-type: none"> One barrier to local feed production is the bad reputation associated to locally produced feed. This is the result of low-quality production by local player resulting in a destruction of the image of compound feed. This intervention is geared towards showing the market that there are ways to produce quality feed locally. For this intervention Dutch and Ugandan private sector players need to work together. Secondly the value of high-quality feed needs to be demonstrated. Most essential will be to change decision making behaviour and get farmers to move away from a price focused to a result focused decision. This could be done through demo farms, but also through local distributors. Through dedicated feed academies farmers can be explained how and what is needed in terms of feeding to obtain particular results. Understanding proper usage of feed is highly practical in nature. To ensure the intervention is deemed credible, veterinarians with expertise in nutritional needs could be involved. Secondly feed could be a specific topic to be addressed through internships. Lastly it needs to be integrated in the educative curriculum. 	<ul style="list-style-type: none"> More affordable and high-quality feed helps farmers in two ways: 1) it reduces the costs of daily operations 2) it improves the productivity of their animals. Therefore they will have less cash out and more cash in, resulting in more profitable operations. Better feed will also result in healthier animals, reduced usage of medications and better usage of quality genetics. Local feed production also improves the economy for other farmers. 	<p><i>Dutch-Ugandan Trade and Investment enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology <p><i>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</i></p> <ul style="list-style-type: none"> # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth). # of Ugandan companies ready to adopt Dutch technology. <p><i>Improved business climate for Dutch and Ugandan companies.</i></p> <ul style="list-style-type: none"> # of supported Dutch interventions in the local business environment for private sector development. Economic performance and resilience of farming systems increased. # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities.
Value chain integration	<ul style="list-style-type: none"> The Ugandan poultry value chain is characterized by an increasing level of vertical integration of the main players, leading to an increasing monopolistic or market structure. Where the major players first only focussed on the supply of DOCs and feed to local farmers, they now also have invested heavily in the production of chicken themselves. This is an unsustainable situation, leading to local friction, low local farmer profitability and has driven many local stakeholders out of the market. It has also led to local farmers increasingly looking to foreign DOC providers such as KenChick and Uzima for their inputs. 	<ul style="list-style-type: none"> For the whole Ugandan poultry sector to develop in a resilient and inclusive manner, with a large number of competing players, specialization is required. This means the set-up of dedicated hatcheries, feed production, outgrow and slaughtering. As these companies can focus on their core business, quality will increase. As well, as they are supplying a larger market, they will benefit from economies of scale. These local companies can benefit from the market gap that is Regional players such as Kenchick have already made this transition successfully and are currently seen as the highest quality DOC provider in the region. The Dutch private poultry sector, which is characterized by such specialization, can be a key partner in this transition. They can provide technical assistance and technology, especially in setting up a dedicated hatchery. 	<ul style="list-style-type: none"> Specialization in the Ugandan value chain will allow for higher quality service provision while avoiding conflicts of interests. It will also increase the profitability of local farmers and promote the domestic production of these inputs. This gives opportunities for mid size farms to develop. Secondly when farmers become more professional the market will become more dynamic and thus reducing the dependency on a few single players. This will remove the need for farmers to vertically integrate. Instead farmers will be able to focus specifically on their core operation. When farmers aim to scale up, they will not need large amounts of capital to invest in all segments of their operation. 	

Supply side interventions (3)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Processing – value of professional slaughter facilities	<ul style="list-style-type: none"> The customary and historical practices do not assign value to these professional processing for meat. The informal market is still very large and often small farmers will be able to butcher animals themselves. However, the market is developing meaning that meat is increasingly being sold through retail and less so at wet-markets. Therefore back-yard slaughtering is no longer suitable to supply to the new demands and standards. The essential link between increased demand for quality meat and increased production of quality animals is the processing facility. When farmers start to increase their production and grow in scale they need to be able to take their animals somewhere. Most essential is creating awareness for the value of professional processing is by ensuring the issues are clear. These main issue in processing revolve around hygiene standards that are related bio-security and waste management. 	<ul style="list-style-type: none"> Perception towards professional processing needs to be adjusted and adequate value needs to be assigned. This can be done in conjunction with educative interventions and by pushing standards down the value chain through increased demand for quality meat. Perhaps an alternative route to implement this intervention is through piggery associations. For one farmer to take a small amount of pigs to a processing facility is quite expensive. However if these types of orders can be grouped then the costs can be split amongst groups of farmers. Again, this might be organized through piggery associations. Another intervention to improve access to professional processing facilities is for the government to create several smaller facilities in different locations or a single larger one. This could spark the awareness for people to bring their animals for slaughtering for a low price to get certified. As a last resort the government could set regulatory standards. However it will be important that these standards not to paralyze the sector. Currently the sector is mostly dominated by frozen products which allows for greater flexibility to cater to fluctuations in demand and supply. However if the market starts to develop towards fresh meat, then there will be little flexibility in terms of meeting demand and supply. Additional regulations could therefore hamper development if local suppliers are unable to meet these standards. 	<ul style="list-style-type: none"> Development of the piggery sector can be deemed to be at an impasse. When farmers have no place to take their animals then it is not possible for them to invest in increased production. However when farmers do not see value in professional processing, then the facilities have no incentive to further professionalize either. Again the sector improves when there are multiple players at sufficient scale. These facilities could in turn also incentivize farmers to change their behaviour and provide an opportunity to change their practices. Therefore it will also serve as a method to increase awareness of the importance of standards. Lastly when new facilities are created then farmers will be able to invest in larger productions as they will now be able to take their animals somewhere. The lack of facilities is one of the most essential bottlenecks for the government to alleviate in order to professionalize the sector. 	<p><i>Dutch-Ugandan Trade and Investment enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology <p><i>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</i></p> <ul style="list-style-type: none"> # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth). # of Ugandan companies ready to adopt Dutch technology. <p><i>Improved business climate for Dutch and Ugandan companies.</i></p> <ul style="list-style-type: none"> # of supported Dutch interventions in the local business environment for private sector development. Economic performance and resilience of farming systems increased. # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities. <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.
Processing – standards	<ul style="list-style-type: none"> When entrepreneurs are scaling up, they do not always take into account that their animals need to be taken somewhere as manual processing will not be feasible at a larger scale. This might be the result of lacking awareness of issues in processing and a skewed value assignment to proper processing When processing meat there are other elements that are important to consider for example environmental aspects such as water treatment, waste management. Awareness about these impacts need to be fully understood by the processor. 	<ul style="list-style-type: none"> The government needs to create the awareness about standards in hygiene and animal welfare. In greenfield operations there is support along the entire process. The tools are there to make any facility successful, lessons, instructions, consultants, instructors. There is large opportunity to implement disruptive technology and leapfrog. An alternative would be to seek out the partners who understand this, rather than work on large systematic changes. A potential intervention is for the polluter to pay. This will also need to be implemented in the informal processing markets in order for the value of professional processing facilities to become clear. Then in turn there will be a business case for equipment that effectively manages waste streams. This development will in turn also improve the hygienic standards in the sector. 	<ul style="list-style-type: none"> When inadequate processing practices are applied contaminations can occur. Old people and young children have the highest risk to suffer from contaminated meat. There is a strong relation to food safety in the application of these methods. 	

Demand side interventions

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Increasing consumption	<ul style="list-style-type: none"> In Uganda the average person consumes 35 eggs per year. For reference in the Netherlands this figure lays around 200 eggs per year. When production is low, there are little economies of scale for producers. This keeps the price high and thus demand low. Hence eggs are also seen as a luxury good. 	<ul style="list-style-type: none"> Start a national campaign about the nutritious value eggs. Will be time consuming process, and for the consumption to “just” double to more than 70 eggs per year will require consistent messaging. Include eggs in school meals, thus normalizing consumption of eggs at a young age, demand will also stay higher later in life. Future interventions could work of diversification and premiumisation, for example the creation of eggs with added vitamin A to differentiate products. Or work towards the production of powdered eggs. However the demand is not there yet, and thus should only be focused on later. 	<ul style="list-style-type: none"> Growth will be incremental and needs to be focused on year after year. This intervention can be done by both government, poultry associations and the private sector. Through this intervention the perception of eggs being a luxury product can also be changed. By increasing demand, production has to increase and thus the value chain is forced to become more professional in its production, in turn leading to the implementation of more cost-effective methods resulting in more and affordable products on the market. 	<p>Increasing natural demand for high protein food stuffs such as meat and eggs not just creates a more dynamic market, there are demonstrable health benefits. Therefore contributing to:</p> <p><i>Peoples' nutrition improved.</i></p> <ul style="list-style-type: none"> # of people with improved food intake. # of people with improved access to healthy/diverse food. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better.
Retail	<ul style="list-style-type: none"> Retailers often have the ability to drive professionalization upstream into the value chain. This can be achieved either through natural demand from consumers who seek higher quality packaged food or through professional institutions. The strength of the Ugandan economy is driving higher standards in demand. Consumers have increased incomes and are therefore able to spend it on latent needs. 	<ul style="list-style-type: none"> Leverage the growing demand for conveniently packaged mean. Meaning that instead of whole chicken or whole pigs being bought and slaughtered at wet markets, offer portion packed products. The private sector could further leverage this trend by working with standards, brands, certifications or other indicators that signal quality to the consumer. Creating a product offering that is different from the wet markets, such as packaging specific parts of meat, such as breast, legs, loin, ribs etc. Such products provide convenience and thus have an added value for the consumers. The value per KG of meat will thus go up. To speed up the demand for quality products the government could start off with setting standards for the public institutions such as hospitals, the army and other hotels, restaurants and institutions. Lastly the government can also work with regulations to enforce higher standards at retailers. This is a measure that needs to be carefully considered as the value chain will need time to adjust to these standards 	<ul style="list-style-type: none"> Through these interventions, standards for quality will need to be set through information such as shelf-life and packaging. This will cause professional processing and good care of animals to be valued. Standards at the end of the value chain geared towards protection of the final consumer, will in turn lead to better standards of production upstream. These products require more work, time and are more labour intensive. In turn this leads to higher labour costs, which improves the business case for automation in professional processing If such processes go too quickly and local players can not satisfy demand, then this could lead to more imports instead of improved local production. 	<p><i>Peoples' nutrition improved.</i></p> <ul style="list-style-type: none"> # of people with improved access to healthy/diverse food. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of value chains/sectors perform better. # of businesses co-investing in FNS activities. <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.
Fast food chains	<ul style="list-style-type: none"> The current driver of higher standards in Ugandan food production are the fast food chains. Fast food chains have a large assortment of products using chicken meat, and fast food chains often have to meet standards set by the international parent companies. These needs are preferably met through local supply as this will lower risk and dependency on imports. 	<ul style="list-style-type: none"> One intervention would be to find a way to create similar drivers for pork. The piggery sector is still lagging, while the market has stagnated there are some strong players left who have intention to grow their business. One way to do this is through the introduction of pork alternatives in fast food. It is the second cheapest meat to produce and therefore could be a good protein alternative for emerging consumers. 	<ul style="list-style-type: none"> Uganda has a strong emerging consumer class with increased income. Food consumption is often one of the primary expenses in which people start to diversify. Therefore by supporting fast food chains to set standards for the industry potential spill overs in other segments of the market can be created. This initiative can therefore be in support to the previous interventions for natural demand and retail. 	<p><i>Peoples' nutrition improved.</i></p> <ul style="list-style-type: none"> # of people with improved access to healthy/diverse food. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of value chains/sectors perform better. # of businesses co-investing in FNS activities. <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.

Educational interventions (1)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Perception	<ul style="list-style-type: none"> Education in Uganda is primarily geared towards larger types of livestock. This is the result from tradition and historical approaches to animal keeping and therefore there is little value associated with poultry and piggery segments. Traditionally, men take care of cows, women take care of poultry. It is therefore an additional income source, not the main one. 	<ul style="list-style-type: none"> In order to professionalize the sectors, the educational programmes need to align with the modern approaches to poultry and piggery. It will be essential for the government through its educational programmes to show the value in these segments, especially when professional practices are introduced. This can be done through examples of successful entrepreneurs. Or for example by illustrating the large demand for skilled labour, both for the daily activities and management. 	<ul style="list-style-type: none"> By improving the perception of different forms of income sources, the sector will be taken more seriously. This is essential to pave the way to a more professional sector. Other spin-offs could include breaking some gender barriers. 	<p><i>Economic performance and resilience of farming systems increased.</i></p> <ul style="list-style-type: none"> # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better.
Content	<ul style="list-style-type: none"> There are only a few livestock and animal science programmes. The content of programmes is very broad, with little focus on either poultry or piggery. Poultry, for example, is an additional subject that is part of a larger veterinary education at BSc level. 	<ul style="list-style-type: none"> The programmes will need to include more segment specific modules. This will allow entrepreneurs in the sector to professionalize their practices and rely less on the academies offered by the private sector. The intervention should focus mostly on the vocational level and BSc levels for poultry. 	<ul style="list-style-type: none"> When local companies can obtain expert advice, or highly skilled labour locally, this will increase the security for job seekers. Furthermore it will allow farmers to improve their operations at a lower cost whilst also improving their profitability. 	<p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/ knowledge/new technologies # of FNS knowledge institutions that perform better.
Teaching method	<ul style="list-style-type: none"> The structure of the programmes is currently highly theoretical. Especially at vocational level, but also at BSc level it is essential to observe the theory in practice. Meaning that even if entrepreneurs can obtain education with content catered to the specific sector, there is a large gap between the theory and practice. 	<ul style="list-style-type: none"> Educators will need to know how to integrate practical lessons in the programme and keep up with recent developments. This is so important to fully develop the skills and embed the theoretical knowledge through practice. Provide guidance on teaching methods and show the potential how people can make the best use of these materials. For example, the classes that the educator work with must be in smaller groups. 	<ul style="list-style-type: none"> The programmes become enriched through the integration of practical teaching. With such elements entrepreneurs have more certainty that the experts that they are seeking truly understand the practical implications of their work. This will allow for more valuable employees, more effective work and in turn better practices. 	

Educational interventions (2)

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Internships	<ul style="list-style-type: none"> Internships are already being used for students to become acquainted with the practical side of their field of study. However these are not done extensively enough. An additional issue is that when students do get access to companies, then the work is often research focused instead of practical application focused. 	<ul style="list-style-type: none"> Practical training does not only need to be offered by the education institutes. A strong collaboration with the private sector is an effective vehicle to allow students to obtain practical experience. The government needs to encourage the private sector to offer internships. This can be achieved both locally as well as internationally, for example in collaboration with EKN and the Dutch private sector players. 	<ul style="list-style-type: none"> The programmes become enriched through the integration of practical internships. With such elements entrepreneurs have more certainty that the experts that they are seeking truly understand the practical implications of their work. This will allow for more valuable employees, more effective work and in turn better practices. 	<p><i>Economic performance and resilience of farming systems increased.</i></p> <ul style="list-style-type: none"> # of farmers with increased productivity/income. # of farmers with improved access to services. # of farmers more resilient to shocks. <p><i>Quality of private sector development for FNS increased.</i></p>
Government	<ul style="list-style-type: none"> For any of these suggestions to be successful the ministry of education needs to be involved. This is the governmental body that determines the type of programmes that are available. 	<ul style="list-style-type: none"> In practice it is not recommended to completely re-arrange any programme. As it will be difficult to achieve success, which is often measured according to the accreditation of such programme. Instead it is better to gradually adjust certain elements. Any intervention should ensure accreditation is achieved before finalizing a project. Because these programmes will only hold value if they are certified at national level. Interventions should first be geared towards poultry for both broilers and layers. Piggery is too underdeveloped and often poorly managed. So while big strides can be achieved in piggery, it is better to focus first of effective production in poultry. Initiatives could be set up through Nuffic programmes. 	<ul style="list-style-type: none"> For students there will be more added value to their education, ensuring them that they have all necessary skills to be a valuable employee. For entrepreneurs it means that they have more access to local expertise, making them less dependent on foreign experts who are also very expensive. This is paramount for the development of small-medium enterprises who will benefit from these changes the most. In the collaborative effort best practices can continuously be developed and implemented making production more efficient. 	<ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. <p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/knowledge/new technologies # of FNS knowledge institutions that perform better. <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.
Partnerships	<ul style="list-style-type: none"> When creating partnerships to develop programmes, experience has shown that strong collaboration is essential. Often there is a mismatch between the responsibilities of partners. As financial incentives do not always ensure that the necessary developments are implemented. Therefore equal buy in from all partners is required to ensure continuity. 	<ul style="list-style-type: none"> Programmes can also be developed in collaboration with private training institutions as they are often highly effective. An alternative solution would be to work with sector associations such as poultry association. These will enable programme developers to truly focus on emerging farmers that are not too big, but also not too small. Aeres is one of the few dedicated experts who can specifically look at a curriculum, assess the need of the market and ensure the program offers the right information. Such an intervention can be addressed through an institutional partnership. It starts with a survey for what is required in the market in collaboration with companies. Then in collaboration with institution the curriculum can be build from there. 		

Institutional interventions

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Animal health	<ul style="list-style-type: none"> In poultry many of the issues are fixed with medication and other additives, instead of structural solution to the problem needs to be created. Still good animal health practices are essential, not just for the local farmer to effectively rear animals, but also for the solutions offered by the Dutch private sector players to work effectively. 	<ul style="list-style-type: none"> Improve the availability and affordability of vaccines. This will ensure that animals are better protected against illnesses and in turn will reduce future use of medications and antibiotics. For the previous intervention to be effective knowledge needs to be available regarding animal health and proper usage of vaccines. In the piggery segment specifically there is a threat of disease and parasites. Proper bio-security measures need to be applied as diseases can easily be transferred by people, transport vehicles and goods. 	<ul style="list-style-type: none"> Quality vaccinations for animal health are essential for the productivity of the animals. It affects the effectiveness of feed and genetics. When the medical system is strengthened then the local farmers are less dependent on service from other aspects. This will in turn lead to healthier animals and better products for people. Food safety is closely linked to animal health and needs to be encouraged and available. 	<p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/ knowledge/new technologies # of FNS knowledge institutions that perform better. <p>Quality of governance for FNS increased.</p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws.
Research and testing	<ul style="list-style-type: none"> There is a high level of distrust in the Ugandan market, caused by poor quality feed, medication and testing. Larger companies such as Ugachicks have their own laboratory to conduct their own tests. However for smaller players, this is very difficult. 	<ul style="list-style-type: none"> Now only larger players are able to obtain reliable data through testing in the Netherlands, South Africa or through their own facilities. Aeres would be able to provide the technical advisors to improve testing of feed and diseases at the local University. 	<ul style="list-style-type: none"> By enabling reliable local testing, smaller companies will have an affordable and reliable option available. This is essential to make informed decisions and put the knowledge into practice. 	
Imports	<ul style="list-style-type: none"> Some Dutch private sector players have expressed the difficulty with obtaining the necessary veterinary documentation for imports in the piggery sector. This was not an issue in the poultry sector. 	<ul style="list-style-type: none"> Improvement of import in piggery along the same lines as is applied in the poultry sector. 	<ul style="list-style-type: none"> While many of the interventions call for some level of governmental reform, these interventions are specifically geared towards a more effective legal framework. As such each of the topics addressed lead to improvements in their own regard. In addition regulation might have a negative impact on local suppliers when standards cannot be met, and imports start to take over the market. 	<p><i>Improved business climate for Dutch and Ugandan companies.</i></p> <ul style="list-style-type: none"> # of supported Dutch interventions in the local business environment for private sector development. The time and money needed to import goods to and export goods from Uganda is reduced. # of projects that can be developed and tendered based on value for money principles (with possibly the involvement of Dutch companies in the process). <p><i>Quality of governance for FNS increased.</i></p> <ul style="list-style-type: none"> # of Improvements in implementation of major national FNS policies/laws. # of FNS knowledge institutions that perform better.
Government tenders	<ul style="list-style-type: none"> In the processing segment it is difficult for the Dutch private sector to be considered for governmental tenders. These are often combined with civil work, resulting in a local construction company taking the lead in writes in on the tender. These companies then they have no incentives to work with a high-quality suppliers. 	<ul style="list-style-type: none"> A solution would be to dedicate a specific amount for the processing facility which reduces the motivation to work with low cost suppliers. Alternative the tenders should be completely separated. Lastly specific requirements for the quality of the processing facilities need to be put in place to ensure the facilities will meet the right standards. 		
Enforcement	<ul style="list-style-type: none"> More regulation and higher standards sometimes are necessary, but also need to be enforced properly. 	<ul style="list-style-type: none"> When the market pushes for higher standards, there will be less issues with reinforcement. Creating incentives for local producers to supply the market with high quality products. 		

Product development interventions

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Modularity	<ul style="list-style-type: none"> The Dutch private sector players often have highly automated equipment. Therefore they often have a preference to work with larger players. However the Ugandan market calls for some adjustments. Solutions should be available for smaller and medium enterprises. Meaning that equipment should be easy to scale, easy to maintain and not very capital intensive. 	<ul style="list-style-type: none"> One development that needs to be leveraged is that Dutch private sector players are also developing more modular products. These are highly suitable for growing markets that require localized production instead of singular high capacity production. The added advantage is that these types of modular products would also be suitable for a larger pool of customers, which will make the market more attractive for the Dutch suppliers as well. 	<ul style="list-style-type: none"> While it would be desirable for the Ugandan poultry and piggery markets to leapfrog into the most developed state with high end equipment, this is simply not realistic. Therefore some adjustments have to be made on the supply side. This will result in developing solutions tailored to the local needs ensuring that expertise can be leveraged. Another aspect that needs to be taken into account is that at times Dutch solutions need to be catered to the Ugandan situation. A direct copy paste will not always be effective and thus it is also essential to closely involve local people. 	<p><i>Dutch-Ugandan Trade and Investment enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology <p><i>Corporate Social Responsibility among (Dutch) companies is enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies with increased awareness and integration of international standards for CSR, including 'living wages'. <p><i>Quality of private sector development for FNS increased.</i></p> <ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities. <p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/ knowledge/new technologies
Maintenance		<ul style="list-style-type: none"> Maintenance of equipment is often not focused on when looking at knowledge and sector development. Due to this lacuna entrepreneurs often seek equipment that is free of high maintenance and quality equipment certainly has a value. Therefore offering regional service engineers who are able to provide solutions quickly is certainly important. 		

Knowledge sharing interventions

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Academy	<ul style="list-style-type: none"> Many Dutch private sector players have their own academy geared towards educating their customers on the usage of their products. These academies come at a high price point due to the high-level experts that conduct the consulting. Therefore it is difficult for small and medium sized enterprises to access to this specialized knowledge. For these parts that require significant investment, such as genetics and processing, the Academy intervention would be a more appropriate alternative as opposed to the demo hub. 	<ul style="list-style-type: none"> Host shared seminars or conferences for clustered groups of local entrepreneurs. In this way the specialized knowledge can still be disseminated, but the costs can be spread amongst a broader group of entrepreneurs. For this to be effective similar needs are to be addressed during a single session in order to ensure the information is relevant to all entrepreneurs. A second solution is to provide some sort of voucher. Then the smaller players that seek to professionalize their operations, but do not have the means to do so can get access to specialized knowledge. This intervention is particularly useful for segments of the market that are highly capital intensive or highly technical in nature and cannot easily be included in a demonstration hub. 	<ul style="list-style-type: none"> Improved access to knowledge. Leading to improved application of sound agricultural practices, potentially creating stronger economical returns. With the provision of vouchers the implementing party needs to take market distortion into account. By disseminating the knowledge through these types of academy sessions, the best practices can also be shared through the networks of the entrepreneurs themselves. Farmers often look towards their peers to obtain information. In this way the trust amongst farmers can be leveraged to promote good agricultural practices. 	<p><i>Dutch-Ugandan Trade and Investment enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies doing business in Ugandan market (investment and trade) The size of total Dutch volume and diversity of Dutch business in Uganda (investment and trade) # of Ugandan companies using Dutch technology # of jobs created by the Dutch private sector in Uganda <p><i>Corporate Social Responsibility among (Dutch) companies is enhanced.</i></p> <ul style="list-style-type: none"> # of Dutch companies with increased awareness and integration of international standards for CSR, including 'living wages'. <p><i>Quality of private sector development for FNS increased.</i></p>
Demo hub	<ul style="list-style-type: none"> Demo hubs have been tried and tested in many different formats in various industries across numerous countries. Some with great success, others less so. There are multiple Dutch private sector players that see value in participating in a demo hub. These players are mostly involved in the segments that can easily be scaled for a demo hub, such as the farm installation and equipment and perhaps some elements for feed production. Some elements of the value chain are highly capital intensive and can only be economically feasible with large scale. 	<ul style="list-style-type: none"> Most Dutch private sector players have indicated that the poultry sector is the most interesting of the two sectors investigated in this study. Therefore the demo hub should be geared towards addressing all different elements of professional animal husbandry in the poultry sector. To set up a demo hub some investment is required. Therefore one has to ensure it is commercially viable. Some Dutch private sector players have expressed hesitation to participate in a demo hub, as it might interfere with the relation with their current customers. Therefore location will be essential. To ensure this, EKN might issue another study to select the right location. Given that many of the Dutch private sector players indicated that a clear commercial interest is essential, a strong entrepreneur needs to be involved for any type of demo hub to operate efficiently. 	<ul style="list-style-type: none"> Improved access to knowledge. Leading to improved application of sound agricultural practices, potentially creating stronger economical returns. Furthermore it can contribute to illustrating the benefits of farming in a (semi-) closed system and using modern equipment, to manage climate, light and animal health to improve productivity. The demo hub once again taps into the Ugandan culture in which farmers seek knowledge from their peers. Seeing is believing. For the Dutch private sector players, the hub will also provide better local support to the customer. With a demo hub these players will be able to educate their dealers through practical trainings instead of theoretical lessons. 	<ul style="list-style-type: none"> # of jobs created in agro food sector. # of value chains/sectors perform better. # of businesses co-investing in FNS activities. <p><i>Quality of knowledge innovations systems for FNS.</i></p> <ul style="list-style-type: none"> # of farmers that adopted research results/ knowledge/new technologies

Financial interventions

Focus area	Challenge/Opportunity	Intervention	Impact	Indicators
Interest rates	<ul style="list-style-type: none"> Local Ugandan parties have ambitions to collaborate and set up collaborations with high quality suppliers, including Dutch private sector players. However high interest rates prevent local entrepreneurs from making investments. 	<ul style="list-style-type: none"> One intervention could be geared towards making loans available with lower interest rates. This can be achieved in collaboration with financing institutions such as Atradius. Secondly, when conventional loans are sought out governments can put up a guarantee so that lower interest rates can be secured. 	<ul style="list-style-type: none"> When interest rates are reduced, entrepreneurs will be able to invest without destroying their profit margins. Increasing Dutch-Ugandan investments and trade that is socially and environmentally responsible and contributing to inclusive growth. 	<p><i>Local SME has strengthened to become investment and technology-ready potential partners for Dutch companies.</i></p> <ul style="list-style-type: none"> # of jobs supported (m/f, direct/indirect; youth/non-youth). # of companies with a supported plan to invest trade or provide services (m/f, local/Dutch; youth/non-youth). # of Ugandan companies ready to adopt Dutch technology. # Number of firms that obtain financial services (including people enrolled in pro-poor insurance programmes).
Risk	<ul style="list-style-type: none"> Local entrepreneurs are generally quite risky for the Dutch private sector to supply to. To cover this risk, full prepayment is required. For local entrepreneurs this means that working capital will be locked up in an investment. Entrepreneurs are stuck at an impasse as they would like to become more profitable through the investment in more efficient equipment but cannot do so because they are not profitable enough. 	<ul style="list-style-type: none"> One intervention is by offering risk guarantee to the Dutch private sector players. When investors fail to make their payments the loss will be covered through this guarantee. Another intervention would be to offer accessible finance options for the Ugandan private sector players. This way they will be able to bridge the pre-payment and not have to chose between capital for daily operations or investments in their operations. Lastly a middle ground can be sought out through export subsidies. This will reduce the amount of money that a Ugandan entrepreneur has to put up front, while also reducing the risk of the Dutch supplier. 	<ul style="list-style-type: none"> By alleviating the risk component for both the Dutch and Ugandan private sector investments can be encouraged. Small and medium enterprises will not have to decide between working capital for their daily operations and investment in improvement of the business. It would be an advantageous development if various types of financing instruments can be created that enable entrepreneurs to invest and remain profitable. 	
Return on investment	<ul style="list-style-type: none"> Investment in quality equipment is often determined by the length of the ROI. For this reason poultry is deemed to have the highest potential as piggery more capital intensive. This results in a longer return on investment and higher risk. In poultry there are many smaller players who are growing and now are ready to invest in equipment to scale up their business. These are interesting for the company. To invest a level of scale is necessary. 	<ul style="list-style-type: none"> One way to reduce the ROI is by offering the right products and technical support. There is great potential for more efficient production especially in the layer segment. Current production estimates are around 70%, this can easily be increased with good practices. Furthermore entrepreneurs can be shown how specific investments lead to improved results. Then there will be more impact and the return will lead to better competitive potential. Exports would be a great vehicle for the improvement of profitability of the Ugandan sector. Uganda certainly has potential to become an export market, as its production is quite competitive when compared to the region. The advantage of exports is that the exchange will be done in USD and therefore the ROI will be better. Export of eggs to Tanzania and Rwanda are already interesting. For poultry export needs to be facilitated to Middle East. 	<ul style="list-style-type: none"> When exports are facilitated, then the ROI will be shortened. This means that investments in capital goods, such as processing facilities, will become more interesting. Not only because the business will be more profitable, but also the risk can be reduced when delivering to a regional market. Also export will drive demand, meaning that local producers can leverage economies of scale, become more efficient and thus reduce costs. If these companies grow, there is a growing supply, the farm sizes will grow, number of DOC increases, amount of feed grows. Integration of chain then also becomes more important. 	