

## **Chicken Production and the Possibility to Process at Young Africa Agri-Tech**

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Livestock plays a vital role for the population of Mozambique as 65% of rural families have chickens, 25% have goats, 12% pigs and 6% cattle. (National Survey Figures, in PEDSA, Ministry of Agriculture, 2010). Here Mozambique, where part of the country is infested with the tsetse fly which can affect cattle, poultry production is of great importance (Mata et al., 2000). One can also see from the above figures, that chicken farming is already the most widespread livestock sector.

Some of the challenges that affected livestock production in Mozambique include sanitary conditions such as disease control and eradication. There are also problems with financing and professionalising veterinary services and the lack of a widespread agricultural extension service, as a result of this, production and productivity has not reached its full potential.

The main food laws affecting meat production in Mozambique are the *Colectânea de Legislação no Âmbito da Higiene Alimentar* of 1994. The law states that meat must display a stamp by a certified inspector. This is almost always so for animals slaughtered in approved abattoirs; however, this meat represents less than 10% of the meat consumed in the country. Most animals are slaughtered and sold informally. Meat from the abattoirs is sold at butcheries and is estimated to be around 60% more expensive than the meat sold at informal markets, where no inspection takes place. (Wageningen U 2016).

Mozambique, like other tropical countries, experiences weather conditions that favour the growth of bacteria as well as fungi and mycotoxins in feed ingredients. Warth et al. (2012) cited by Dos Anjos et al. (2015) reported that 46% of maize samples in Mozambique were contaminated with Aflatoxin at concentrations ranging from 16.3 to 363 µg/kg with an average concentration of 114 µg/kg. (Wageningen U 2016 )

The “Competir com Qualidade”, a Private Sector and Quality Promotion Programme in Mozambique, funded by the European Union and the Government of Austria and implemented by UNIDO, has been supporting the development of a national quality infrastructure and related services. It aims to strengthen food safety capacities in various areas, such as water, fishery products and food testing (UNIDO, 2015).

Mozambique is a fairly large producer of broiler chicken and eggs. In 2015 it was estimated to have produced 75.000 tons of chicken meat which was not enough to meet the demand of the country.

The percentage of imported broiler meat used to be 65% just after the turn of the 21st century but has been reduced to about 25% during the last 10 years. NGOs, private companies and governmental efforts contributed to this success. The Mozambiquan Poultry Producers Association (AMA) developed advertising campaigns and helped to improve import regulations about safety and health aspects which were necessary and both beneficial as well as helping to reduce imports of substandard meat, especially controlling the import of expired and falsely re-labelled chicken from abroad which used to be dumped in Mozambique. (Wageningen U 2016).

The reduction of imports has created a lot of additional employment opportunities in broiler production here in Mozambique (we have around 100.000 small holders and around 15 large producers). Eggs are still mainly coming in from imports as the layer industry is not yet well developed in this country, total imports amounted to 90% of all eggs in 2012 (FAO, 2013) and is still

very high. The soybean sector has also developed accordingly as much of the harvest is used for poultry feed grown by about 30.000 soybean farmers.

The additional broilers required by the market are imported mainly from Brazil, South-Africa and the USA (EUA). The foreign competition usually comes from very efficient large-scale poultry farms which can produce at very low cost which Mozambique cannot easily match and this continues to keep prices down and is making it harder for small Mozambiquan farmers to compete. (Article: “Mocambique quer ser lider mundial na producao de frangos (20.12.2016 dw.com)). On the positive side, consumers enjoy relatively low prices due to an ample supply of chicken meat.

### **Labour**

Given that the majority of operators are individual or family-owned, businesses do not have many workers. There is, however, a large dependence on family labour, most producers hire between 1 to 3 family members. This upper range is consistent with the average household size in Mozambique, which is 5. There is almost gender parity in the employment of family members. It is also notable that family labour is not only unskilled but mostly unpaid as shown in a study done in 2 provinces Zambezia and Niassa (96% unpaid in Zambézia versus 95% in Niassa), results are probably similar in Sofala. (Wageningen U 2016 )

### **Young Africa Agri-Tech**

Here at Young Africa Agri-Tech we operate an agricultural training centre for disadvantaged youths and a farm of 200 hectares, located near Dondo, Sofala. We produce bricks, milk, yoghurt, butter, pigs, rice and other crops, mainly vegetables and recently once again, broiler chicken.

Poultry production needs inputs such as: day-old chicks, feed, veterinary supplies (mainly vaccines and medicines), housing, equipment, labour and knowledge providers (training). All of these are already available at YA Agri-Tech though additional investment is required to expand.

We have the capacity to further increase our broiler chicken production (as well as to start egg production). Our current broiler unit has been re-started after renovating 6 poultry houses which had been severely damaged and put out of production by Cyclone IDAI in March 2019. These buildings have later been restored and were put into operation again at the end of 2019. We started buying day-old chicks (pintos) to raise for meat (frangos de corte). These broilers are ideally only kept for about 28-30 days and are fed with commercially purchased starter and subsequent growth rations. The chicken are sold alive to the local population and in the town of Dondo.

The unit has been handed over and is now run again by our previous franchisee who currently (Aug 2020) sells the birds alive for 210 MZN each. This is a very competitive price as on the market streets in Dondo dealers ask around 250 MZN. The birds weigh around 1 kilo (about 75%/750 g net weight of meat) at 4 weeks of age but those sold late have to continue to be fed daily while the buyers pay the same price for them even though they are of a higher weight.

It would of course be more profitable to sell all birds at about the same time once they reach the right size as extra rations are an additional expense rarely compensated for by the market. It is however not easy to sell so many live birds (usually raised in batches of 500 or even 1000) within 2 or 3 days, especially as competition has increased a lot due to the availability of 1-day old chicks (pintos) and feed rations in the Dondo area, which has allowed many small local producers to enter the industry.



*Day old chicks at YA Agri-tech*

Rural customers in this area prefer to buy live birds as many of them have no refrigerator (or even electricity) at home and as they also take neck, gizzard, liver, heart, lungs and feet. They can also keep the animal for a bit longer and feed it with scraps to kill it later.

This limits the number of birds we can sell each day as we depend mainly on local buyers or small traders. To encourage customers to come here the franchisee has put his price lower than the market traders in town.

Each individual sale also involves a transaction cost as it takes time to receive the customer, catch and tie up the chicken, take in the cash and write a receipt for each purchase which must then be checked by the guard at the farm gate.

Live chickens are often transported by motorcycle taxis on behalf of buyers, sometimes carrying 25 or more tied to a stick. Some customers come by foot due to our low prices to buy just one or two, some take more, often coming on a motorbike taxi. Depending on distance the cost of such transport is around 10-20 MZN for a short ride, 40 MZN from town. Each entry to the farm also involves some work for the security guard to check.

We are now planning to restart a few additional broiler houses of our own which are located further away on the farm. They still need a little improvement and we are also in the initial process to build another big henhouse.



*Almost 3 weeks old*



*Chickens sold live on the YA Agri-tech Farm*

## **Slaughter and Processing of Chicken**

As the market for live birds is limited by the constraints of transport and local market demand, the possibility to process the birds on the farm has been contemplated as this would allow us to sell far more broilers. We would also not have to compete too much with our franchisee for the limited local market for live birds. We cannot not easily charge more for live chicken than our franchisee does (We used to charge the market rate of 250 MZN before he took over).

He could also easily increase production if demand grows and as his premise is located much closer to the farm gate than our chicken houses, it is thus more convenient for customers to buy from him. On the other hand, we have a truck to transport live birds further away if we can find a buyer for larger quantities. We used to sell batches of birds to a nearby NGO for example. The local demand for the broilers is however still growing as word of mouth increases knowledge of the very low prices the franchisee is charging.

### ***Training aspects:***

Another reason for processing chicken on the farm could be the opportunity to train our students in those skill; we have so far concentrated mainly on the production aspects of poultry farming, so processing skills would be an ideal addition.

Further training and extension services in agriculture are still required here in Mozambique. The growth in number of producers is not matched by adequate training and extension services.

According to a report of Wageningen University it might take 8 to 10 rounds of broilers, or up to 2 years to become a skilled and experienced poultry farmer and during that learning period some farmers drop out, often losing their investment. Training helps to get started and avoid costly mistakes. There is no government poultry extension service, and poultry farming is often not part of livestock curricula. (Report CDI-16-027 Wageningen U 2016)

Only a few private companies engage in training activities here in Mozambique (Example: Cargill). Here in Sofala, one of these providers is Young Africa Agri-tech which offers accredited TEVET certificates in agricultural subjects with a strong practical focus.

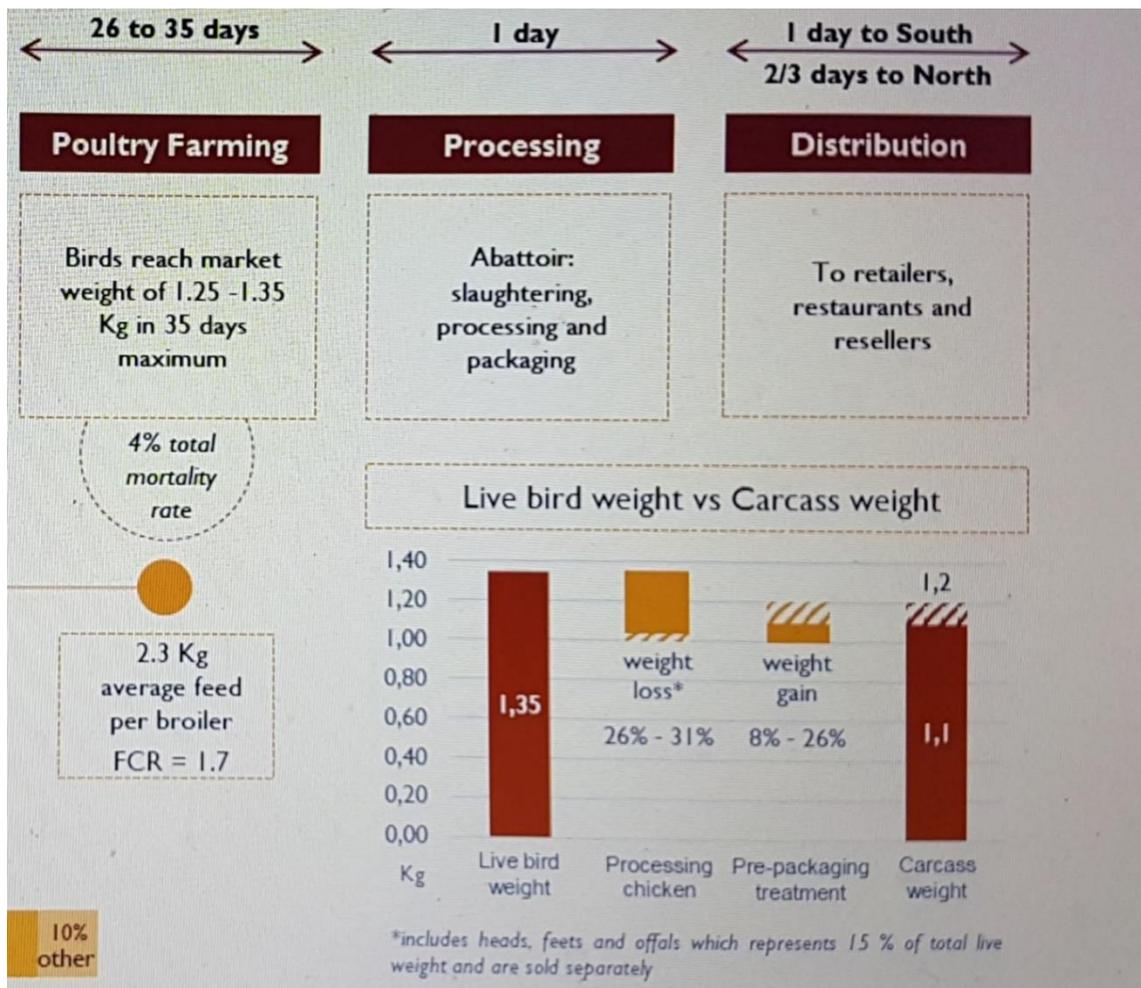
### ***Potential Products***

There are a couple of products you can offer when you are rearing broiler chickens. This amounts to live or dressed birds as well as chicken-parts such as legs, wings, breasts or by-products such as necks, gizzards, hearts, livers and feet.

### **Live Broilers**

The market price of live chicken in this area is fairly uniform, buyers rarely pay much more than a certain standard rate, even 5 weeks old broilers may at best be sold for 10 or 20 MZN more than a 4-week old broiler and even that surcharge may be difficult to obtain.

Increased competition from abroad and higher production in Mozambique, as well as the effect of Covid-19 on incomes of the local population has driven prices down. According to our franchisee, he was easily able to sell more chicken at a higher price during his previous operation here at YA (before cyclone IDAI destroyed the facilities).



(from Higest 2018)

### Advantages of selling live broilers

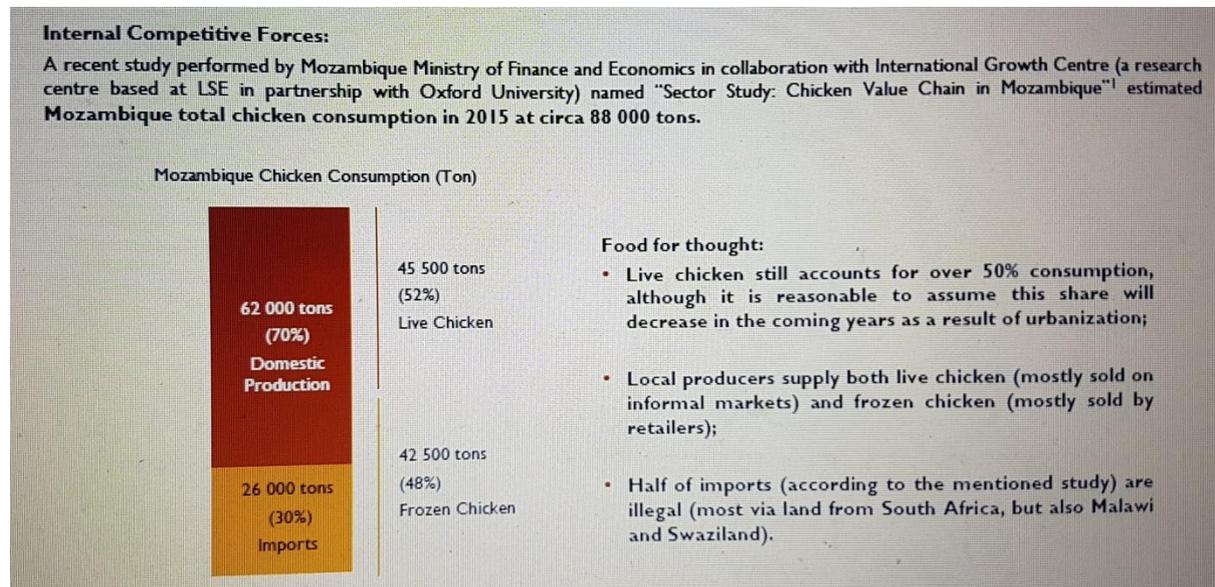
- No extra work and cost of slaughtering the birds
- No need for packaging and freezing them etc
- No investment and running costs for a processing unit
- buyers usually come to the farm
- Less government health regulations to follow
- birds can be sold at a lower weight than dressed chicken

### Disadvantages

- Birds will need to be fed until they are eventually sold
- Take up more space when transporting compared to dressed chicken.
- limited market reach

## Processed (Dressed) Chicken

You could also slaughter your broilers, package and freeze them, but you will need a slaughtering and processing facility. You will then sell the so-called dressed chicken, and the price will depend on the weight. The price at which you can supply processed chicken to butchers or restaurants varies with time, depending on supply and demand.



(from Higest 2018)

Here in Mozambique however, slaughtered birds, fetch a lower price per kg as live chicken. Slaughtering at a small scale is therefore, not really profitable per se but slaughtering on the-farm when birds cannot be sold alive on time, can be done to avoid higher feed and labour costs of keeping birds for an unnecessary longer period until they are finally could be sold (Wageningen U 2016). The Wageningen University study also stated: **"...Slaughtering is only feasible as a separate commercial business, if it is undertaken at a large scale, in a very efficient type of operation."**

If you are able to supply dressed chicken to supermarkets, you will have to label the packaging, provide information such as expiry date, weight, name of company, contact details etc. and you will have to pack them according to specified weights e.g. 1.0Kg, 1.2 kg 1.5Kg, 1.8kg, 2.0Kg etc as the supermarkets usually require an assortment of certain weights for customers to choose from. In Beira the smaller chickens are usually preferred by the supermarkets.

### Advantages

- customers don't have to slaughter, process and prepare the meat.
- You can supply butchers, restaurants and supermarkets, thus a larger market. You can sell further away, too if you have cooled transport.
- you can sell a lot more broilers

## **Disadvantages**

- If you are supplying processed chicken to larger supermarkets and butcheries, they might require that you slaughter your chicken at government approved abattoirs, which increases the cost of slaughtering.
- Slaughtering and dressing the meat increases your costs.
- processing by-products is labour intensive, needs different packaging and marketing efforts
- Power cuts may affect the quality of your meat; it may spoil altogether

## **Broiler Market**

In Mozambique there is a good market for broilers. It is the type of meat people can most easily afford here due to the small size of the animal purchased and the relatively low cost of meat (around 250 MZN per kg, much cheaper compared to beef or pork).

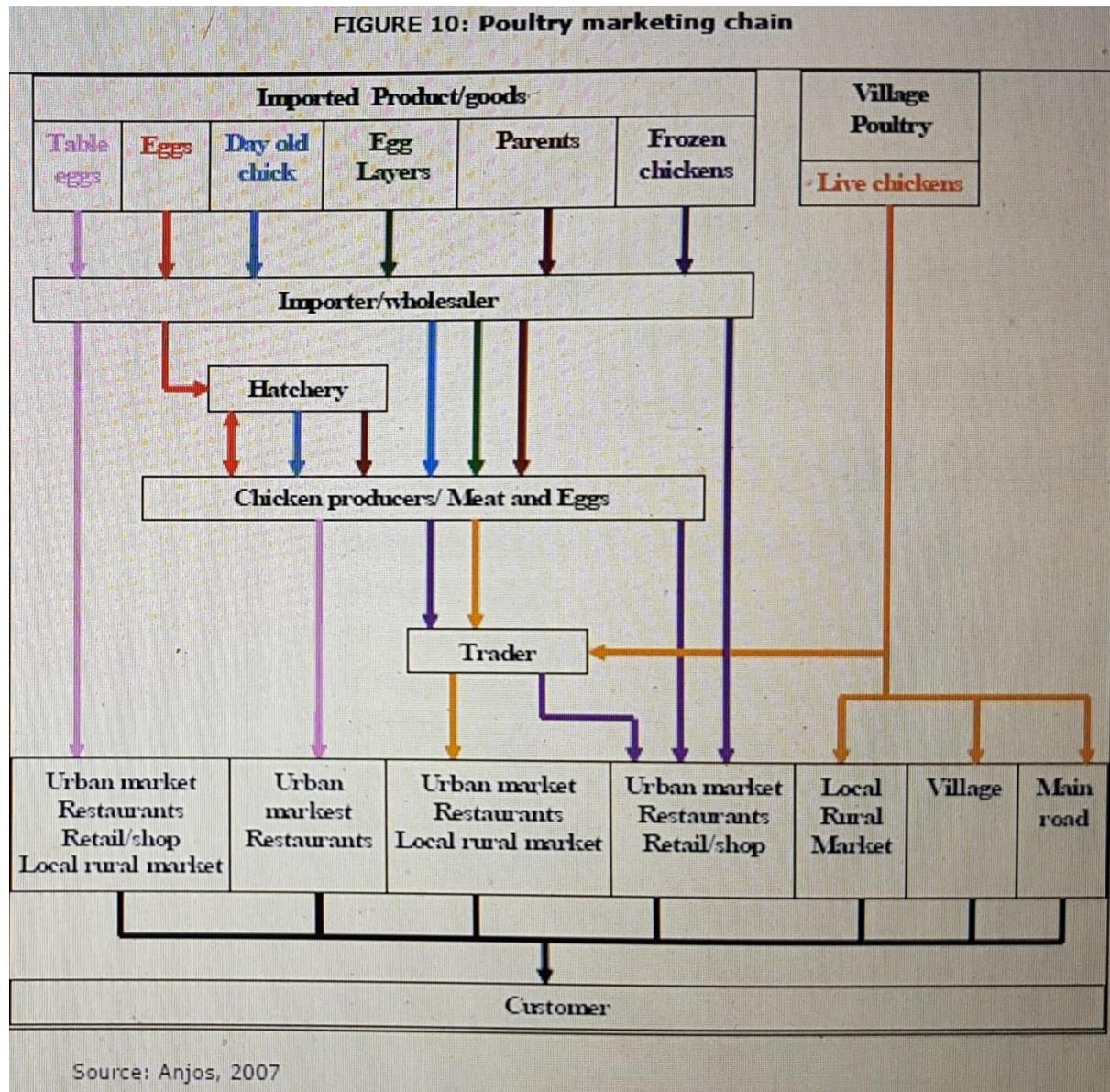
Regions where economic growth rates are highest, such as Africa, Asia and Latin America, are also those where the population growth rates are high, reaching a record on the African continent. The top 20 nations include Niger with 3.8% annual growth, Angola with 3.4%, Uganda with 3.3% and Mozambique with 2.9% (Worldometer.info 2020). The Mozambiquan population of around 31 Mio is young, 43% are under the age of 15, the average age is 19. The majority live in rural areas (70%) (African Development Bank 2019). The drought of 2016, Cyclone Idai in 2019 and the current Covid-19 pandemic made the need for food aid necessary to sustain part of the population.

Mozambique ranks 181 out of 188 countries on the Human Development Index (2016) and faces considerable challenges such as high poverty levels (54.7% of its population) and unemployment (22%). It is estimated that around 87% of the youth are employed in vulnerable jobs – either in subsistence farming or in the informal sector. (El-Hadj Bah 2019)

The demographic projection for Mozambique is 100 Mio inhabitants in 2078 and 123 Mio at the end of this century. ([www.worldpopulationreview.com](http://www.worldpopulationreview.com)). It becomes clear that such level of growth is unsustainable and might be cut short by limits on food and other resources.

While income and population increase, meat consumption will also increase and the market for poultry is almost certainly increasing.

## The Poultry Marketing chain



(from FAO 2013)

The Cooperatives Union (UGC) sells 50 000 broilers to the market every week. About 40 percent is processed and frozen and the remaining 60 percent is sold alive in different markets such as in Maputo, Gaza and Inhambane provinces. In order to run this activity, UGC has delivery trucks.

For small scale production marketing involves the sale of live chickens either by the owner or a through a trader. The selling price to the consumer varies according to the area. In the province of Sofala, traders buy around 50-200 chickens and sells them at the market with around 10% profit.

(FAO 2013)

## Marketing of village chickens

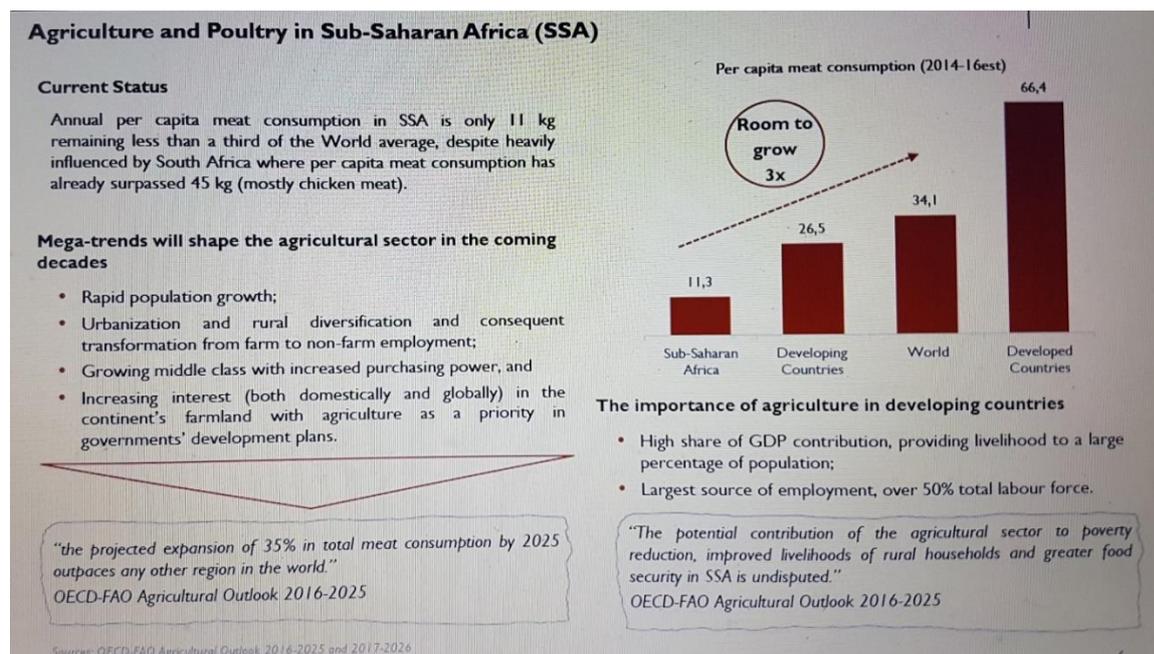
In villages there is no formal marketing of scavenging chickens or eggs. The usual practice is to sell chickens alive and keep some eggs for reproduction. The main marketing channels for village chickens are from farmer to farmer or to consumer, another one is from a farmer to a trader and then to consumers. Some farmers sell directly to restaurants, while others sell to traders who take the chickens to the urban market. These channels fall into two types:

### **Chickens sold within villages**

*Rural chicken producers sell chickens from farmer-to-farmer or to travelling traders. Sometimes fellow farmers who need animals for breeding may buy them as well. Some farmers give birds to children to take them to the roadside for selling. Informal traders move to the rural areas to buy or barter chickens (Bagnol, 200, . FAO 2013.)*

### **Chickens bought in the rural areas and sold in the urban centres by traders**

Within villages there is usually a small market to sell chickens and also to buy various household items with the income from the sale of their birds. For instance, in Beira City market, chicken traders sell birds that were bought elsewhere. In general resellers buy about 100-150 chickens even from up to 200 km away. The traders may also go from household to household to buy chickens. When the traders have a sufficient number of (usually around 30-50) birds, they leave the village and returns to the city to sell them in live poultry markets. In rural regions traders go by road to buy chickens, sometimes to isolated areas approximately once a week. The price paid depends on the size of the chickens, they are resold in cities. In Beira, major sales occur in June and July, because it is the period in which many traditional ceremonies are conducted. Both men and women are involved in the marketing of free-range chickens. In the centre of the country, trading is mainly done by men while in the South, women are more involved. A study by Gondwe et al. (2005) concludes that trading of village poultry also involves neighbouring countries. (FAO 2013)



(from Higest 2018/FAO Agric. Outlook)

## Development of the chicken production industry

In terms of broiler management, the move to enclosed production systems in which animals of different ages are segregated and raised apart indoors has had a positive impact on disease control. The ability to use vaccines and pharmaceuticals to control the spread of poultry diseases helped expand large-scale operations, allowing farmers to achieve significant economies of scale and unit-cost reductions. Improvements in feed technology ensured that the improved breeds are using a better combination of ingredients at the least cost because of shorter production cycles and better feed conversion ratios. The trend towards increased processing of birds into a variety of convenience foods and the success of fast food chains such as Spur, Mr. Frango, Kentucky Fried Chicken, McDonald's, Burger King etc. has further accelerated the growth of the broiler industry.

At the same time there has been a major structural change in the poultry industry throughout much of the world to take advantage of economies of scale, specifically in the developed world. Many developing countries however have also moved towards larger-scale broiler operations. Some operators contract the raising of chicken out to smaller farmers who supply them. Today, the commercial poultry industry in most countries is moving towards large-scale factory style operations. These companies are characterized by a high level of vertical control and ownership or coordination among suppliers of production inputs, poultry growers, poultry processors and marketing firms.

Collectively, the changes outlined above have led to a decline in world meat prices over time, particularly for poultry. However, prices are expected to increase again as a result of the rising price of maize, soya and other feed inputs as well as increasing overall demand for meat as countries develop. During the 1980s and the 1990s, real prices of poultry declined at a rate of 3 percent per year. This decline continued, but at a slower rate. The downward trend in prices was brought about by factors, such as improvements in the efficiency of production of large-scale poultry operations (Delgado et al., 2003) and rapid technological progress, especially in the United States of America (Narro, 1997, in YA BP 2017) but this knowledge also trickled down to other countries.

Consumers as a whole have benefited from the livestock industrialization process, as a result of reduction in meat prices. It is known that poultry meat and eggs contain valuable protein and micronutrients etc. which provide an important contribution to health and nutrition of consumers. For the urban poor, the fall in prices meant an increase in their purchasing power, leading to greater economic access to poultry meat. Moreover, especially in the case of poor households engaged in small-scale backyard poultry raising chicken are likely to be their main source of animal protein (Neumann et al., 2002; Barroeta, 2007, YA Business Plan 2017).

The main poultry producing areas in Mozambique are around Maputo, Chimoio, Nampula, Beira and Tete but people keep chicken all over the country.

Especially Chimoio has a well-established poultry industry. Inputs in this area are provided mainly by one large supplier (Empresa Avicultura Albilio Antunes) of both day-old chicks and feed. The present capacity of companies in terms of provision of day-old chicks and feed, often determines the size of the broiler industry in a specific area. Feed transport to or from other regions of the country is an option, but more expensive due to additional transport costs. (U Wageningen 2016)

The producers of broilers can be divided by the following FAO standards (FAO, 2013), as small scale (< 1,000 broilers). medium scale (1,000 – 10,000) and large-scale producers with a housing capacity of over 10,000 birds. We also find the so called scavenger production system.

### **Scavenger poultry production**

Many rural families keep a few chickens for eggs and private consumption. These provide part of the household's food and they find their own feed by scavenging or eating scraps. They are not commercially produced but still have to be taken into account.

### **Small and medium scale poultry producers**

Such broiler farms are found in rural areas and in urban areas. Broilers produced by small scale producers are usually sold as live birds rather than processed, the targeted market includes the low income to middle income earners. These producers also sometimes supply restaurants, butcheries, schools, prisons etc. Medium scale producers also supply abattoirs.

Approximately 76% of the broilers are sold alive, the rest is slaughtered. (Wageningen U 2016).

Most Mozambicans are small scale producers. They face high unit costs of production while more sophisticated operations in neighbouring countries enjoy the benefits of economies of scale that easily outweigh the transport costs.

The government has tried to help the sector through a number of steps, some more dramatic than others. In 2017, the government banned poultry imports. While the ban covered many countries (including South Africa and Zimbabwe), the main target was Brazil, which was believed to be flooding the market and inhibiting the growth of the local industry. The ban was later relaxed for chicken imported from South Africa (El Hadj Bah 2019).

### **Large Scale poultry producers**

These big players usually produce their own day-old chicks, which they themselves rear. They sometimes also outsource the rearing of the broilers to contract farmers. They are the largest producers of broilers in many countries, supply local markets as well as export markets. The producer's contract grower scheme has brought a number of medium and large farmers into the poultry rearing business. The recruitment of contract growers has aided in meeting consumer demand of chicken and also contributed to economic growth and employment. Large-scale producers supply dressed chicken to abattoirs, butcheries, supermarkets, and fast food outlets. According to "O Pais" (20.5.2020) we have 15 large scale producers in Mozambique.

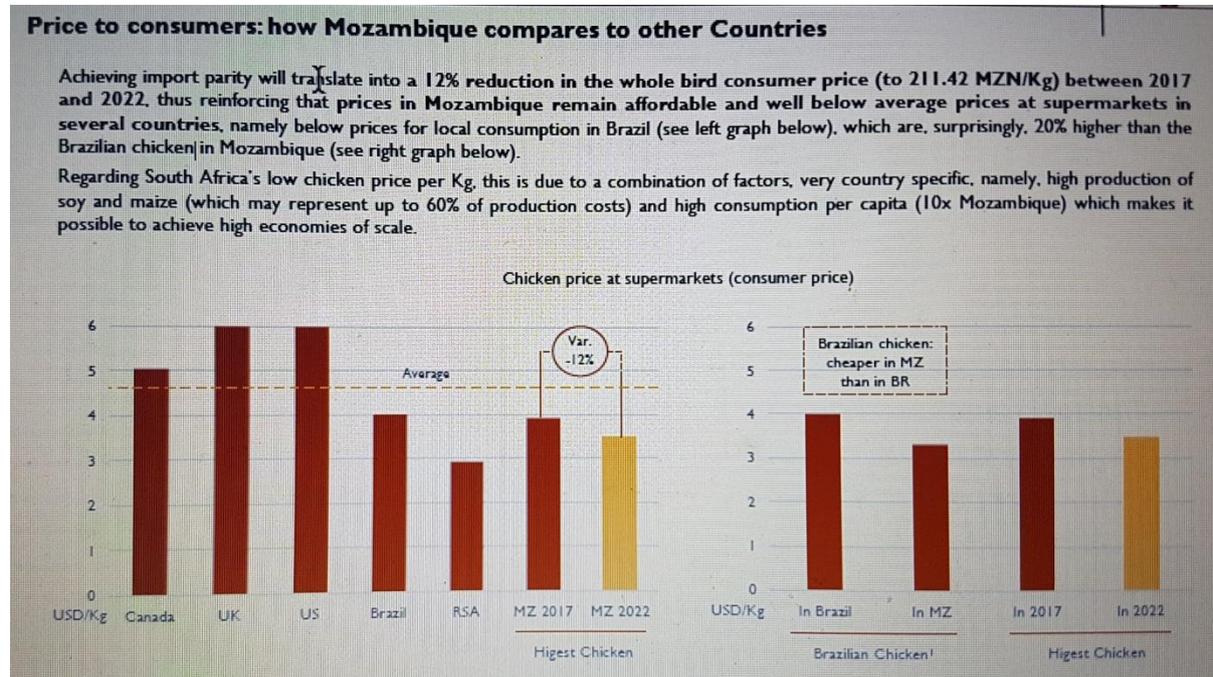
### **Imported Chicken**

Some of the chicken sold in Mozambique are imported mainly from Brazil and RSA, but also occasionally from Swaziland, Zimbabwe, Malawi and Zambia. Some countries have resorted to putting high import tariffs for chicken, as a measure of protecting the local poultry producers as imported chickens are very cheap. This is currently also requested by the industry in Mozambique. As a result of tariffs, the amount of imported chicken may then decline significantly. However even in the presence of such restrictions, some may find ways of smuggling the chicken into the country without paying the regulated tariffs leading to unfair competition. This is still a major problem according to the Ministry of Agriculture. An import ban was implemented for a few months until Dec. 2020 and it is anticipated that Mozambique needs no imports of broilers at all in 2021 (O Pais 20.5.2020).

## Example Article in “O País” Mozambique 3.6.2020:

### “Apreendida tonelada e meia de frango na fronteira de Ressano Garcia

Uma tonelada e meia tonelada de frango com marca sul-africana foi apreendida na noite de quinta-feira na Fronteira de Ressano Garcia, província de Maputo, numa operação de combate ao contrabando de produtos agro-pecuários”. (03 de Julho 2020 16h48, O País}



(from Higest 2018)

## Competition and Buying Patterns

There is competition from large scale producers, and hundreds of local small-scale producers. Brand names and price are important to consumers when buying packaged chicken cuts. Large supermarkets tend to buy dressed chickens from well-known large-scale producers as those are easily marketable. Thus, it is more difficult for a newcomer to penetrate this segment of the market. For live birds, brand names don't matter, consumers are more concerned about price, weight and healthy appearance of birds. For small butcheries and restaurants, brands do not matter much either, but price does. This market segment can be penetrated with good marketing strategies. They tend to buy locally from those who are reliable and do not usually buy imported chicken. They are willing to establish relationships and enter into long term supply agreements with suppliers who can reliably deliver the chicken to them when they need it (YA Business Plan 2017)

## Egg Production

Egg production is not part of this study, but I would like to point out that it is far riskier than broiler production. Good layers are expensive and live a lot longer. They need to be fed continuously until they are replaced. They could of course also be raised on the farm, but the capital will then be tied up for a long time and the returns from eggs come much later and are much slower than for broilers. The risk of mortality from diseases, bad weather etc is much higher as well as the potential loss of your investment and far more difficult to replace. Most high yielding layer birds are hybrids, you have to buy them and cannot hatch your own chicks. Producing hybrid layers is a very specialized and complicated process and can't be done at a small scale.

## **SWOT Analysis Chicken Processing at Young Africa Agri-tech**

### **Strengths**

- We have an established brand name which is already well known
- We can produce broilers of high quality and a continual supply of birds for processing.
- We have plenty of space and water at our farm
- We have some experienced operators for raising the chicken
- We have student labour available most of the time
- Good breeds of fast-growing broiler chicks are available locally
- 3 bird houses can be restored easily to supply processing broiler demand
- there is ample space to build a processing facility of any size
- we are connected to the electricity network and have a back-up generator
- as a Non-Profit Organization we can apply for international donor financing

### **Weaknesses**

- Lack of capital: Investment is needed for a proper processing unit
- high requirements for hygiene which are hard to meet in a small-scale operation on a farm
- considerable government regulations apply
- need of specially trained people for commercial processing
- people working in commercial processing need a health certificate
- low negotiation power with buyers due to competition from large producers and imports
- processed birds do not fetch higher prices per kg net weight than live birds
- birds reach minimum size after 5 to 6 weeks instead of 4 thus higher feeding costs and lower batch turnover
- needs proper branded packaging with origin, expiry date, etc
- final product must meet standard and uniform weight
- needs ice to cool birds before freezing or shock freezer
- needs large freezers (for only this purpose) to freeze and store birds higher electricity costs
- no refrigerated transport of our own, cooled transport is not available
- slaughtering is a lot of extra work

- requires separate treatment, packaging and sale of gizzards, liver, heart, neck, feet
- offal and feathers need to be securely disposed off
- Offensive smell and flies
- Salmonella risk is high; also from flies which enter the school kitchen and hostals
- health hazard due to fast bacterial growth. Needs considerable care and sterilization of equipment
- low ownership of fridges by our usual customers means they prefer live birds
- Distribution channel for larger production not yet well developed

### **Opportunities**

- The demand for processed poultry meat is vast and growing
- Processing chicken allows us to sell more birds
- Processing allows us to kill birds that reach desired size without need to feed them longer
- Opportunity to be a local market leader
- Opportunity to strengthen our reputation as a food processing training provider
- poultry processing can produce a fairly predictable income stream
- Poultry processing skills can be taught to our students (valuable qualification)
- Processing unit can be another showcase of Technology at YA Agri-tech
- Sources for referrals and joint marketing activities with partners could extend our reach
- Production can be increased without worry of selling all birds on time
- Distribution of frozen chicken to restaurant and hotels is possible
- Gizzards, liver, heart, neck, feet can be sold separately
- Growing market. Expansion will be the status of the industry for a long time

## Threats

- contamination by bacteria such as Salmonella might cause an outbreak and compensation claims, processing plant closure can result
- zoonotic avian flu viruses or other poultry diseases could lead to death of birds or closure of operation
- Decline of demand in frozen or freshly slaughtered chicken (unlikely, but a recent example is shown below ++)
- other processed meat and fish is a substitute
- Government inspections might force us to invest in better facilities or close down
- Low market prices for frozen chicken
- Change in government regulations which we possibly cannot meet
- Overall increase in feed costs
- Frozen chicken imports keeping prices below profit margins
- Increasing local competition might cut profit margins further

### ++Example 1:

Millions of chickens had to be culled in April 2020 all over India due to misinformation that Covid-19 is spread by eggs and chicken. Sales of poultry products dropped dramatically, many producers went out of business. ([www.Hindustantimes.com](http://www.Hindustantimes.com) April 3, 2020)

### ++Example 2:

Closure of restaurants and fast food chains in many countries has negatively affected the sale of poultry. *Covid 19: considerable impact on the poultry value chain* ([www.poultry.net](http://www.poultry.net) July 20, 2020)

## Strength and Weakness of the Poultry Sector in Mozambique

| <i>Strengths and weaknesses of the poultry sector</i>  |   |
|--|---|
| Strengths  | Weaknesses  |
| Experienced strong growth in the broiler sector over the past decade through strong collaboration with government, private sector and NGOs | Layer section still poorly developed  |
| Strong lobby organisation  | Shortage of locally produced day-old chicks, too high dependency on imports.                    |
| Successful national marketing campaign implemented   | Quantity and quality of available feed still insufficient (no good coverage across the country) |
| Improved availability of soy as feed protein source  | Poor poultry veterinary services, inadequate disease control                                    |
| Poultry housing can easily be established, with mainly local building materials  | Poorly developed training and extension services  |
| Commercial poultry keeping can easily be started by small scale producers, does not need large investments                                 | Still strong preference for "wet market" which can be a threat to bio security                  |
| Vaccines and other inputs are easily available from South Africa   | Production often still insufficient, due to poor management practices                           |
| Good market: chickens are popular all over the country   |   |
| Good producer margin at current prices, despite relatively high feed prices (also due to costs of importation from South Africa)           |   |
| Improved quality control systems since growth of the sector started  |   |

(Wageningen U 2016)

### Competitors/suppliers

The largest poultry producers include the General Union of Agricultural and Livestock Cooperatives (UGC), Mozambique Farms, the Mozambique National Poultry Association (AMA) and Higest Mozambique in the south of the country; Frangos de Manica, Empresa Avicola Abilio Antunes in Chimoio, Manica; Novos Horizontes; Frango King and Pintainhos Stewart (Nampula).

Of these, 4 are so called integrated poultry chains, namely: Empresa Avicola Abilio Antunes, Novo Horizontes, Astral Foods and Frango King (Wageningen U 2016). Some of these also sell inputs and can be regarded as suppliers for chicken farmers. Example: Higest-Mozambique supplies utensils, feed rations and chicks, a store of Higest is also found here in Dondo.

**Empresa Avicola Abilio Antunes:** Currently, Antunes has only one integrated poultry farm in Mozambique and is based in Chimoio, Manica province. It has a bio security level (FAO classification as a sector 1 producer) in accordance with international standards and is vertically integrated with separate profit centres: a parent stock, Incubator, hatchery, poultry farms, **slaughterhouse** and a feed mill. Antunes keeps both broilers and layers. The company procures an estimated 13,000 tonnes of soybean and 20,000 tonnes of corn annually (AGRIX, 2012, FAO 2013).

**Novos Horizontes (NH)** a vertical integrated farm from breeder to the abattoir which started in 2005 and had early support from Techno Serve and Holland. NH now supplies 40,000 day-old chicks per week from 187 out-grower families, which produce 40 tonnes of poultry per week. Families build a **chicken house according to NH specifications, including a bio security fence**. NH provides the chicks

and feed (AGRIX, 2012) and NH has recently expanded into egg production. Each farmer receives approximately 1,600 day-old chicks and feed. The one-day-old breeder's chicks come from surrounding countries such as Zimbabwe, Zambia and South Africa (FAO, 2013). (Whiting, 2010).

**Astral Foods:** *One of South Africa's leading integrated poultry producers establishes itself as an integrated broiler producer in Mozambique. Construction began in 2011, 45km south-west of Maputo. The company initiated its presence by establishing a feed mill (Meadow Mozambique Limitada) in 2010, in partnership with a local businessman and farmer. Presently, it produces 12,000 tonnes of animal feed on average per year. A hatchery and a breeder farm opened in 2012 near Mozpintos. The hatchery has a capacity of 158,000 day-old chicks per week. Three poultry houses will be refurbished to house broiler breeders. In addition, Astral plans to build three new broiler breeder sheds, allowing the hatchery to become self-sufficient in supplying hatching eggs (AGRIX, 2012).*

**Frango King (FK):** *FK is owned and operated by the African Century (a Mauritius based investment fund) and is one of the largest poultry producers and distributors in northern Mozambique (Nampula). FK produces and distributes day-old chicks, poultry feed as well as live and frozen birds. These products are sold domestically, through their own network of shops. Current production is around 3 million birds per year. The business is fully integrated with its own hatchery, feed mill, production, processing and distribution (AGRIX, 2012). To ensure the feeding of birds, FK has contracts with soya producers in the district of Gurué in Zambezia (Sergio Gouveia, oral communication, December 2015)."*

#### **Higest-Mozambique according to their own statement:**

Another important producer is Higest in Maputo They also have their own slaughterhouse and produce 700.000 to 800.000 frozen chickens per month.

Established in 1993 Higest is one of the few vertically integrated poultry companies in Mozambique and produces, distributes and sells animal feed, day old chicks and frozen chicken. The company has invested significantly and since 2009 chicken output has multiplied four fold, thus capturing circa 24 % of the market and having a leading chicken brand called "National". They have a store in Dondo and have also supplied YA with chicks.



*Dondo Higest store*

## PESTLE ANALYSIS

Any business can be affected by Political, Economic, Social, Technological, Legal and Ethical factors.

### **(P)olitical**

The Mozambiquan government is committed to develop the poultry industry and to reduce unnecessary foreign imports and unfair competition from smuggled and substandard meat.

Tax policies of the Government could affect the operations of the poultry business and its profitability.

Changes in employment laws, safety regulations especially those related to poultry processing and hygiene would affect the business.

Changes in import tariffs or availability of poultry feed and other relevant inputs would affect the business.

Difficulty of importation of vaccines or medicines needed in poultry farming (Ex. due to Covid-19 or other disturbances) could be a factor of importance.

We assume that political stability will continue in Mozambique, but the current situation with the RENAMO Military Junta attacks in Sofala could affect transport and business.

### **(E)conomic**

Interest rates would affect the cost of capital

Inflation determines the rate of remuneration for employees and affects the price of products.

Strong population growth as experienced in Mozambique (around 3% p.a.) should increase demand for poultry products for many years to come. As it is still relatively easy to enter the market as a poultry producer, higher local production is likely to meet the demand and keep the industry competitive. Many additional small producers are likely to enter the market. As the economy develops demand for processed chicken will increase on the long run as it has all over the more developed countries. Only very few consumers buy live chicken in Europe for example and even in a modern African city like Johannesburg it will rather be the exception than the rule.

LN Gas exploitation in the North might increase disposable income of the population which usually also means a higher consumption of processed meat, especially poultry.

Thus, processing has a good future but favours well organized larger operators. An-established business usually has an advantage over new entries but there is still scope to enter the industry here in Mozambique depending on the region.

If one looks at the stringent regulation and inspection of the poultry processing industry in more developed countries, one can imagine what the future could bring especially in the light of the Liquid Gas extraction industry and its potential for economic development in Mozambique. After the Covid-19 pandemic, the awareness for the need of prevention of potentially dangerous outbreaks of Salmonella, Listeria, Campylobacter, E. coli, Avian flu and antibiotic resistance and residues in poultry could increase significantly

## **(S)ocial**

Social development can lead to changes. A good example is the animal rights movement demanding an end to factory style poultry keeping and asking for more humane treatment of animals. This has led a lot of consumers to ask questions about the origin of products such as chicken meat. The current Covid-19 pandemic has wreaked havoc on social interactions and affected many sectors of business and society. The influence of religion is seen in Europe: An increase in immigration of Muslims has for instance greatly reduced the consumption of pork during school meals or company canteens in many European countries, some also offer Halal meat now. Health consciousness also increased, Vegetarians and Vegans have for instance become a lot more prevalent. The apparent danger of red meat for cardiovascular disease-risk favours fish and chicken consumption etc. while the Fast Food culture in the USA has changed consumer health and behaviour rather negatively.

Anyhow, quoting an opinion stated by Higest-Mozambique: When it comes to meat, chicken is a national champion in Mozambique with frango no churrasco” a local favorite. Furthermore, bearing in mind the country’s low income, eating meat is still not widespread and seen by many as a small luxury, reserved only for special occasions and ceremonies. As such, with increasing income and a rising middle class, chicken is likely to remain at the forefront of consumers choices. (Higest-Mozambique 2018)

## **(T)echnological**

Technology is always affecting any type of business enterprise. It is usually necessary to be aware of any changes which your competitors adopt so as not to fall behind. Being a leader in new technology can be a competitive advantage as well as a risk.

## **(L)egal**

Change in laws and regulations regarding slaughter and processing of poultry mainly aiming for better safety and hygiene is likely and could affect poorly set up small and medium operators the most. New legislation may create risks of not being able to comply with such laws or at least create a considerable burden of further investment need to meet new requirements.

## **(E)thical**

Ethical factors are concerned with the social responsibility of the company. The poultry farm has some ethical rules to follow regarding humane raising, maintenance and slaughter of animals as well as the health and safety of employees, students (in our case), the community and consumers.

Ethical aspects in agriculture such as the use of food plants such as maize for the production of biofuels, palm oil plantations, forest destruction, overfishing the oceans etc have become serious threats. In the poultry business this may also involve such aspects as using spoiled feed (danger: mycotoxin accumulation in the birds), antibiotic residues in the meat, lack of meat inspection, Salmonellosis, etc.

## Risk Analysis

Certain risks could materially adversely affect our business, financial condition or results of operations. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also affect our business, financial condition or results of operations. (YA Internal Info)

### ***Fluctuations in the availability and price of raw materials, especially stock feeds, maize and soya meal and other inputs could negatively impact our earnings.***

*“Results of operations and financial condition, as well as the selling prices for our products, are dependent upon the cost and supply of commodities and raw materials such as stock feeds, maize and soya meal. Production and pricing of these commodities are determined by constantly changing market forces of supply and demand over which we have limited or no control.”*

*Volatility in our commodity and raw material costs directly impact our gross margin and profitability. The company’s objective is to offset commodity price increases with pricing actions over time. However, we may not be able to increase our product prices enough to sufficiently offset increased raw material costs due to consumer price sensitivity or the pricing postures of our competitors. In addition, if we increase prices to offset higher costs, we could experience lower demand for our products and sales volumes. Conversely, decreases in our commodity and other input costs may create pressure on us to decrease our prices.” (YA BP 2017)*

It was reported by the FAO that prices of maize have increased significantly over the last few years all over Southern Africa due to a higher demand from a rapidly rising population and reduced production due to economic problems (especially Zimbabwe), drought, cyclone IDAI as well as land degradation and climate change. Even a worldwide shortage of maize occurred at times and is likely to increase as soils degrade and more meat (often maize fed) is consumed as a percentage of the total human diet as well the conversion of maize etc. to biofuels.

Poultry feed is mainly composed of maize, wheat, and soya, which make up about 95% of the volume while the remaining 5% consists of minerals and vitamins. The Mozambique feedlot market consists of 8 companies, 3 of which are in the Maputo province (HIGEST, CIM – Companhia Industrial de Matola and UGC), 3 in Nampula, 1 in the province of Manica (Abilio Antunes), and 1 in Niassa (FAO 2013; AGRIX 2014)”. (El-Hadj Bah 2016)

It has been already evident that many imported products have increased considerably due to the COVID-19 pandemic and the decrease in the value of the Metical (MZN) against the US\$ or the Euro etc. The price of locally produced chicken (and many other products as well as labour) has however stayed stable due to strong competitive forces and low income, Covid-19 pandemic etc.

### **Examples: Articles in “O Pais” 2020:**

#### **1.” Produção da Soja no país: Celso Correia quer reduzida importação de óleo e ração para frangos e gado**

*O Ministro da Agricultura em visita de trabalho a província da Zambézia, fez uma profunda reflexão em volta da produção da soja, uma cultura importante não só na produção de ração para animais, mas também para a indústria sobre tudo na produção do óleo entre vários outros derivados.”*

23 de Maio 2020 12h16, Jorge Marcos

## **2.” Mais frango, menos clientes e preço mais baixo**

*A maior farma de produção de frango no norte do país viu-se obrigada a baixar o preço do frango congelado em 5% para permitir a saída do produto. Neste momento, tem um stock de 380 toneladas e os mais de 700 trabalhadores estão no activo.”*

20 de Abril 2020 19h08, Ricardo Machava

## **3.” Avicultores pedem fim de importação de frango**

*No país existem cerca de 15 maiores produtores da cadeia de frango espalhados pelas três regiões, nomeadamente Sul, Centro e Norte. Mas mesmo assim, o frango continua a ser um alimento de luxo para várias famílias moçambicanas, situação que se deriva da sua difícil aquisição, dado ao elevado preço.”*

19 de Maio 2020 22h36, Carlitos Cadangu

### ***Outbreaks of livestock diseases can adversely impact our ability to conduct our operations and demand for our products.***

*Demand for our products can be adversely impacted by outbreaks of poultry diseases, which can have a significant impact on our financial results. Efforts are taken to control disease risks by adherence to good production practices and extensive precautionary measures designed to ensure the health of our broilers.*

*However, outbreaks of disease and other events in the country, which may be beyond our control, in our own poultry farm could significantly affect demand for our products, consumer perceptions of certain protein products, the availability of livestock for purchase by us and our ability to conduct our operations. Outbreaks in our own poultry farm may lead to the death of all our broilers. Moreover, the outbreak of livestock diseases, particularly in our Chicken segment, could have a significant effect on the livestock we own by requiring us to, among other things, destroy any affected livestock. Furthermore, an outbreak of disease could result in governmental restrictions on the import and export of our products to or from our suppliers, facilities or customers. This could also result in negative publicity that may have an adverse effect on our ability to market our products successfully and on our financial results. (YA 2017 BP)*

In 2006 a total of 40 outbreaks of **Newcastle disease** were diagnosed in Mozambique, 21 of which were from Maputo province, one from Gaza, 17 from Sofala (FAO 2013)

### **If dressed chicken become contaminated, we may be subject to liability claims or recalls.**

Our products may be subject to contamination by disease-producing organisms, such as *Listeria monocytogenes*, *Salmonella* and *Escherichia coli*. These organisms and pathogens are found everywhere in the environment; therefore, there is a risk of infection especially through slaughter of chickens. These pathogens can also be introduced into our products as a result of improper handling during further processing and handling, foodservice or to the consumer. These risks may be controlled, but not be completely eliminated, by adherence to good hygiene practices and finished product testing (which would require considerable investment, care and skills).

***“This may lead to increased risk of exposure to product liability claims, increased scrutiny and penalties, including injunctive relief and plant closings by the country’s regulatory agencies, and***

***adverse publicity, which could exacerbate the associated negative consumer reaction. Any of these occurrences may have an adverse effect on our financial results.” (YA 2017 BP)***

The danger of salmonella contamination in chicken is indeed very high, especially in the tropical climate prevailing in Dondo. Utmost hygiene and immediate cooling of slaughtered birds followed by packaging plus rapid freezing or immediate sale is extremely important. The bacteria can also be transmitted to lettuce, onions, garlic, strawberry and other crops by fresh chicken manure. The most recent large-scale Salmonella outbreak just hit the press in August 2020. Onions became contaminated with Salmonella in the USA (CDC communication 8.2020) probably due to the use of chicken manure. So far 640 people became seriously ill and many hospitalized. Sales and exports of onions suffered huge losses as the exact source of the contaminated onions has not yet been found. Millions of onions had to be recalled or thrown away and meals in restaurants were also affected. The search for the origin is still ongoing (9.8.2020).

### **Example Article in O Pais 2020:**

#### **1.Suspensa importação de frango da Polónia devido a uma bactéria**

*Está temporariamente suspensa a importação de frangos e seus derivados provenientes da Polónia, concretamente do fornecedor Superdrob. (21 de Abril 2020 12h32, António Tiua)*

An outbreak of Escherichia coli (EHEC strain) infected about 4000 and killed 53 people in Germany in 2011 after fenugreek sprouts became contaminated by a deadly toxin releasing E. coli strains on an organic farm. Some victims who survived suffered from serious kidney failures. The bacterium was first suspected to have come from Spanish vegetables and has cost the producers in Spain losses of 200 MIO \$ per day due to import restrictions. When the source was finally traced to an organic farm, it was closed down and subject to liability claims. Another outbreak, also causing kidney failures; took place in the USA in 2018 and was transmitted by lettuce. E. coli is commonly found in the gut of animals and in chicken manure which can come in contact with plants.

## **Veterinary health, public health, biosecurity measures**

Diseases constitute one of the major constraints to the development of livestock production, limiting the increase of livestock numbers and in some cases the trade. Lack of knowledge of the epidemiological situation, the weak impact of control measures, prophylaxis and treatment are the main reasons for huge economic losses through death or disease in small scale farming and in the commercial sector.

### **6.1 Highly Pathogenic Avian Influenza (HPAI)**

#### **Risk areas for avian influenza transmission in Mozambique**

Mozambique is like other African countries at risk of the introduction and spread of HPAI. In Mozambique, poultry is kept everywhere, and biosecurity standards vary from reasonable to low. The most common production system is family poultry, which consists of the extensive (or scavenging) system where all birds move freely within the village, mixing with other animals or the small-scale intensive poultry production where the birds are fenced in and fed. Most birds are sold alive throughout the country, on markets or by traders, which constitutes a risk of spreading disease (Lennström, 2009).

Major weaknesses to identify and control HPAI include: Weak diagnostic capabilities at the national and sub-national level for detecting and confirming the disease in both animals and humans; difficulties in providing compensation for the compulsory culling of poultry (which may discourage individuals and communities from reporting suspected cases); a weak rural veterinary network; and other risky behaviours due to poverty and lack of awareness.

Mozambique is part of the major migratory routes of birds from Europe and Asia (DNSV,2006). Many species of migratory birds regularly visit Mozambique and some of them appear in large numbers leaving large amounts of faeces. Five areas of high susceptibility for Avian Influenza outbreaks have been identified based on high poultry density, high pig density, high human density, **high poultry to human ratio and near wetlands (as found at YA Agri-tech) such as presence of ponds and stagnated waters used by both ducks and wild birds serve as reservoirs of the H5N1 virus;**

(from FAO 2013)

***“Changes in consumer preference could negatively impact our business.***

*The food industry in general is subject to changing consumer trends, demands and preferences. Trends within the food industry change often, and failure to identify and react to changes in these trends could lead to, among other things, reduced demand and price reductions for our brands and products. We strive to respond to consumer preferences and social expectations, but we may not be successful in our efforts. [...] We could be adversely affected if consumers lose confidence in the safety and quality of certain food products, or in the food safety system generally.*

*Continued negative perceptions and failure to satisfy consumer preferences could materially and adversely affect our product sales, financial condition and results of operations.*

***New or more stringent government regulations could impose material costs on us and could adversely affect our business.***

*Changes in laws or regulations that impose additional regulatory requirements on us could increase our cost of doing business or restrict our actions, causing our results of operations to be adversely affected. The government may remove the high import duty on poultry products. This would lead to the market being filled with cheap imported chickens, which will be difficult to compete with. Thus, the demand of local chicken will decrease, and it will also force the prices of our products down, which will adversely affect our product sales, financial condition and results of operations.”*  
**(YA 2017 BP) To be considered: Health certificate for chicken processing workers is required by law!**

***“Deterioration of economic conditions could negatively impact our business.***

*Our business may be adversely affected by changes in economic conditions, including inflation, interest rates, consumer spending rates, energy availability and costs and the effects of governmental initiatives to manage economic conditions. Any such changes could adversely affect the demand for our products, or the cost and availability of our needed raw materials, and packaging materials, thereby negatively affecting our financial results.*

***The loss of one or more of our largest customers could negatively impact our business.***

*Our business could suffer significant setbacks in sales and operating income if our customers’ plans and/or markets change significantly or if we lost one or more of our largest customers. Our retail customers typically do not enter into written contracts, and if they do sign contracts, they generally are limited in scope and duration. There can be no assurance that significant customers will continue to purchase our products in the same mix or quantities or on the same terms as in the past. The loss of a significant customer or a material reduction in sales to, or adverse change to trade terms with, a*

*significant customer could materially and adversely affect our product sales, financial condition and results of operations.*

***The prices we receive for our products may fluctuate due to competition from other food producers and processors.***

*The food industry in the country is intensely competitive. We face competition from other food producers and processors that have various product ranges and geographic reach. Some of the factors on which we compete include pricing, product safety and quality, brand identification, innovation, breadth and depth of product offerings, availability of our products and competing products, customer service, and credit terms. If we reduce prices but we cannot increase sales volumes to offset the price changes, then our financial condition and results of operations will suffer. Alternatively, if we do not reduce our prices and our competitors seek advantage through pricing or promotional changes, our revenues and market share would be adversely affected". (YA 2017 BP)*

Illegal import of chicken from Swaziland, South-Africa or other countries to avoid import duty or inspections of poor products is a problem.

It is also well known that substandard, expired or several times re-frozen chicken have been dumped in Mozambique. This erodes consumer confidence in frozen or packaged chicken and will make government control and regulations more likely which might also affect local poultry processing requirements.

***Extreme factors or forces beyond our control could negatively impact our business.***

The ability to make, move and sell products is critical to success. Natural disasters, fire, pandemics or droughts, floods, excessive cold or heat, cyclones and storms, could impair broiler production or interfere with our processing operations due to power outages, fuel shortages, damage to our production and processing facilities or disruption of transportation channels etc. Any of these factors could have an adverse effect on our financial results.

***Theft & Vandalism***

*"There is a risk that our poultry farm may be subject to theft and vandalism. This could have an adverse effect on our financial results, as we might end up losing our birds." (YA 2017 BP)*

## **Local chicken prices in the Beira Region on 13. August 2020**

In August 2020 I visited 2 supermarkets in Beira to compare prices with our live chicken. The top of the range supermarket was Shoprite, one of the cheaper stores was Motichande. Prices for processed chicken were as follows:

### **Prices of chicken in Dondo**

Live chicken weighing 1.0 to 1.2 kg at 4 to 5 weeks fetch around 210 MZN (YA Farm Franchisee) to 250 MZN (Dondo market). Net weight would be around 700 to 850 g.

**Processed chicken at Motichande Supermarket (“National” brand of Higest)**

**Net weight/Price**

1.4 kg 260 MZN

1.6 kg 270 MZN

1.8 kg 295 MZN

**Processed chicken at Shoprite (“National” brand of Higest)**

**Net weight/Price**

1.2 kg 275 MZN

1.3 kg 285 MZN

1.4 kg 290 MZN

1.5 kg 295 MZN



*Shoprite Beira: Chicken of 1,5 kg at 295 MZN and 1.2kg at 275 MZN*

### Processed chicken at Shoprite (“Novos Horizontes” brand)

1.0 kg 239 MZN

1.2 kg 255 MZN

1.4 kg 275 MZN



*Novo Horizonte chicken at Shoprite 1,2 kg at 255 MZN*

As can be easily seen, to compete with the big brands sold at Motichande or even the more expensive SHOPRITE Supermarket by processing our chicken is impossible.

We would have to feed them a lot longer to reach the minimum required sizes of net weights of 1.0, 1.2, 1.3, 1.4, 1.5 or 1.8 kg as offered there.

We now get 210 MZN for a live chicken of around 0.7 to 0.8 kg net weight (we even used to sell them live for 250 MZN last year).

At 210 MZN per .70 kg bird we actually get 300 MZN per Kg meat

At 210 MZN per .80 kg bird we still 262 MZN per kg meat.

MOTICHANDE’s best deal 1.8 kg meat for 295 MZN works out at 164 MZN per kg meat processed, packaged, labelled, transported to the shop including a profit margin for the shop. How much would they buy them for from the producer I don’t know but at least less than half of what we get for selling chicken alive!!

## Slaughtering facilities in Mozambique

In 2013 there were 12 poultry slaughterhouses officially registered in Mozambique. They all supply slaughtered and processed chicken to the urban market of the larger population centres. Six slaughterhouses are located in Maputo, four in Manica, and two in Nampula. (Wageningen U 2016)

### *Poultry slaughterhouses by province*

| Provinces | Numbers | Installed capacity | Produced (2009) |
|-----------|---------|--------------------|-----------------|
| Maputo    | 6       | 33 820 800         | 3 599 103       |
| Manica    | 4       | 11 012 400         | 3 112 000       |
| Nampula   | 2       | 10 608 000         | 729 926         |
| Tete      | 1       | 1 144 000          | 144 300         |
| Total     | 12      | 56 585 200         | 7 585 329       |

Source: FAO, 2013 (found in: Wageningen U 2016)

So far, no approved abattoir exists near Dondo. There is a small privately owned slaughter facility to open soon by one of our instructors (Ivan Geli in Nhamathanda. Some small operators also process chicken informally in Dondo as he told me).

Should Young Africa Agri-tech start a large processing unit or go for a small operation to slaughter just a few chickens and store them if we cannot sell all birds on time? The latter seems to be the most realistic option unless we want to invest large amounts of capital and increase broiler production or even slaughter for other producers in the area. The location of the farm is not ideal for a large-scale processing operation as we are quite a few kilometres away from the tar road and the path to the farm is often in a very bad condition, especially in the rainy season. **We could possibly send chicken to be slaughtered elsewhere near Dondo**, but we also have the option to establish a small processing unit of our own or continue to sell live birds.

## Requirements for a small chicken processing unit for up to 50 birds per day

### Major equipment for such a small processing unit would be as follows:

Four funnel slaughtering cones to place the birds in before killing them (250 Rand each)

A larger dip tank boiler (poultry scalding) with temperature control to immerse dead birds (from 8000 Rand depending on size)

A machine to remove feathers from the dead birds (poultry drum plucker) (7000-14.000 Rand)

A-pressure hose and water supply to keep spraying the birds and wash out feathers while plucking.

A stainless-steel butchering bench with a sink to cut open the birds (a self-constructed alternative is possible but unlikely to meet requirements for larger number of birds unless made from steel).

A large bin with water for ice (or a shock freezer)

Large amount of ice to pre-cool the birds

A large freezer (not to be used for other purposes)

High pressure power washer (around 10.000 MZN)

## Small items

Sharp knives and gloves

Scale

Packaging (labelled plastic bags and boxes)

Sealers for packaging

Buckets for gizzards, livers, necks, hearts

2 Bins for offal

2 Bins for feathers

A site to dispose of offal and feathers

Cleaning equipment

Sterilizing fluids for tools and work bench etc

Hand sterilizer fluids

*Most of these items are available locally, while feather pluckers and water scalders, cones etc are available in South Africa see: [www.eggincubator.co.za](http://www.eggincubator.co.za)*

### Home Page and other products

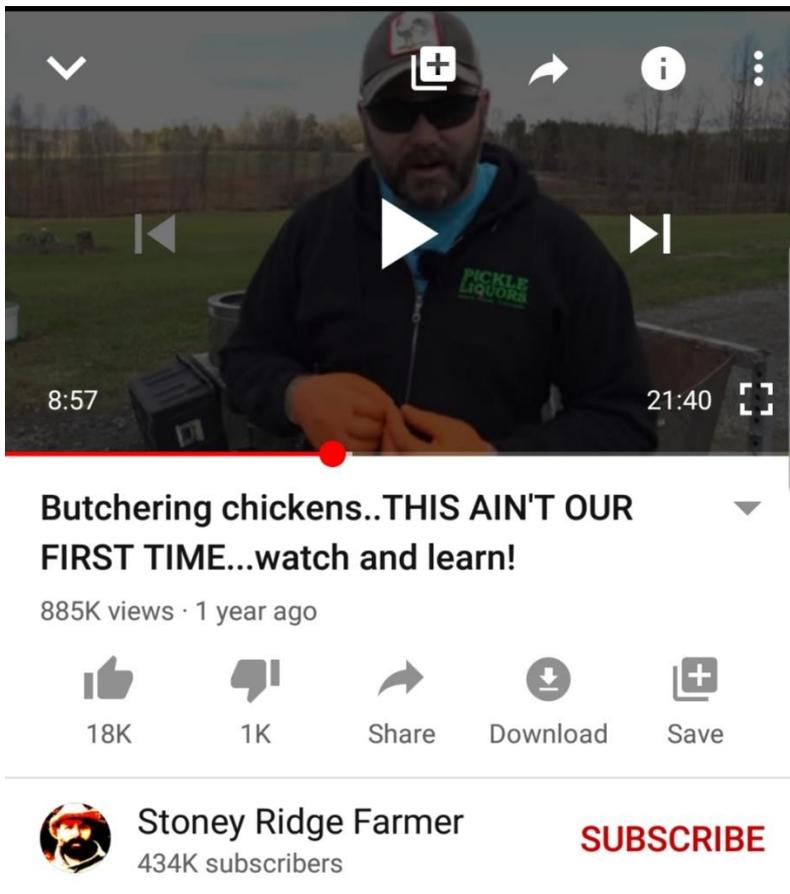


**Chicken slaughtering**

**cone R240 Incl VAT**

For a detailed **video** using such small scale processing tools please see:

<https://youtu.be/inYCz-UVyFQ>



The image shows a YouTube video player interface. The video player itself shows a man wearing a dark jacket with 'PICKLE LIQUORS' written on it, a baseball cap, and sunglasses, standing outdoors. The video progress bar is at 8:57 out of 21:40. Below the video player, the title is 'Butchering chickens..THIS AIN'T OUR FIRST TIME...watch and learn!'. The video has 885K views and was uploaded 1 year ago. Below the title are icons for Like (18K), Comment (1K), Share, Download, and Save. At the bottom, the channel name is 'Stoney Ridge Farmer' with 434K subscribers and a red 'SUBSCRIBE' button.

**Butchering chickens..THIS AIN'T OUR FIRST TIME...watch and learn!**

885K views · 1 year ago

18K 1K Share Download Save

 **Stoney Ridge Farmer**  
434K subscribers **SUBSCRIBE**



Home Page and other products

### Poultry Drum Pluckers SA

Botswana, Zambia, Namibia, Zimbabwe, Mozambique Our Products are especially popular in Cape Town, Johannesburg and Pretoria



Chicken slaughtering  
Price R240 Incl VAT



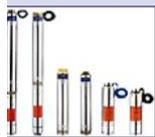
Industrial chicken incubator



obby Incubators



Quail Cages



Electric Pumps



Easy Vegetable planter



## Specification for chicken Drum plucker:

Special price 19 Aug 2020

Prices in red color at the bottom of the plucker photo and stock available.

Automatic chicken plucker/poultry plucker/chicken de-feathering machine stainless steel.

### Automatic chicken plucker/poultry plucker/chicken de-feathering machine

#### 1. Use and maintenance

chicken plucker/poultry plucker is used for removing the hair of the slaughtered chicken, duck, goose, etc.

Depilation can be finished in once time, the plume, fuzz, claw and the dirt of the surface etc. The machine also can be used for removing the skin of ginger, potato, mackerel scale etc.

#### 2. Steps

Put the slaughtered poultry into the hot water of 60 to 80°C, for scald uniformly. Then, turn on the machine.

About 20 seconds, unlock the water faucet, to washing the chicken feather or ginger skin out.

At last, stop machine, and take out the products is ok.

In the normal time, for unhairing the chicken feather is **only need 20 seconds**.

#### 1. Entry level based model.

These electric models are pickers/Pluckers for poultry that removes feathers off chickens, ducks, pheasants, quail in as little as 10 - 30 seconds.

2. Simply scald chickens, then drop up to 1-3 birds into the tub. In 12 - 45 seconds or less the birds will be plucked clean. No pin feathers, no backache. And it is ready to use.

No need to build or install any plucking fingers.

Plucking fingers is already in place.

3. Plucking Target: 16kg of chicken per minute

4. Heavy Duty Commercial Grande Professional Poultry Plucker

5. Stainless Steel Tub & Plate

6. Feather & Water Discharge

7. Belt adjustable Nut

## Types of plucker

| Model                      | PL-50                         | PL-60                                | PL-80                                |
|----------------------------|-------------------------------|--------------------------------------|--------------------------------------|
| Capacity                   | 8kgs/min<br>(about 2 chicken) | 13kg/(0.5-1)min<br>(about 3 chicken) | 16kg/(0.5-1)min<br>(about 6 chicken) |
| Weight                     | 52.K g                        | 57K g                                | 61K g                                |
| Volume                     | 66*62*99cm (0.4cbm)           | 63x63x95cm                           | 76x60x95cm                           |
| Power                      | 750W                          | 2200W                                | 4500W                                |
| Rubber Finger              | 111 Pcs                       | 132                                  | 144                                  |
| Barrel diameter            | 500mm                         | 550mm                                | 560mm                                |
| Main axis Rotational speed | 180r/min                      |                                      |                                      |

Please note some customers complained the chickens gets cut in the machine. you must do according to instruction soaking in hot water and only 20 second in the machine.

We can not do any testing or training. If you are not happy you can return the machine with your own cost and we deduct 5% refund you 95% of machine cost.

Direction on Google map: <https://goo.gl/maps/qQi4kzrtnPAXZDZB8>



Please not a small drum plucker can not do job of a bigger plucker.

We need to know on which size to quote you.

PL50 Price: **R7,100** incl VAT

PL60 Price: **R8,200** incl VAT

PL80 Price: **R14,000** incl VAT

Quail plucker **R4,000** incl VAT

e-mail: [icm@lantic.net](mailto:icm@lantic.net)

[Order form, Proforma invoice](#)

**ORDER NOW!**

Extra Fingers cost **R22** each.

but they are different sizes.

1- Soaking chicken in hot water of 60 to 80 degree, for 30 second.

2- put chicken in the plucker for 20 second only and wash the machine.

Demo on U-tube Video:

[www.youtube.com/watch?v=mpnkuJXWgYw](http://www.youtube.com/watch?v=mpnkuJXWgYw)

[Order form, Proforma invoice](#)

**poultry scalding with water tap**

|               |                    |
|---------------|--------------------|
| Item No.      | WQ-ES120L          |
| Item name     | poultry scalding   |
| Material      | stainless steel    |
| Voltage       | 220V~240/50Hz~60Hz |
| Power         | 2 +2 kw            |
| Capacity      | 120L               |
| Item Size     | 500*500*630 mm     |
| <b>Energy</b> | electricity        |
| Package       | Plywood            |

- \*Stainless steel housing for a lifetime of service
- \*Twist-knob temperature setting and a separate On/Off Button
- \*Sensitive thermostat control switches the powerful heating element On & Off
- \*"Heater On" indicator light
- \*"Heat-Ready" indicator light
- \*Has the Volume / Thermal Mass to scald 10kg batches of freshly-killed poultry in quick succession
- \*Much more economical to operate than a gas burner
- \*Easy to clean - Drain cock fitted - The heating element is covered by a removable grate

| Model   | Voltage  | Power | Capacity | Weight | Size(mm)    |
|---------|----------|-------|----------|--------|-------------|
| WQ-70T  | 220-240V | 2kw   | 70L      | 15Kg   | 380*460*620 |
| WQ-120T | 220-240V | 2+2Kw | 120L     | 23Kg   | 500*500*630 |



**poultry scalding with water tap**

**R7000 incl VAT**

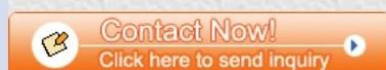
**item SCALder**

Direction on Google map: <https://goo.gl/maps/qQi4kzrtnPAXZDZB8>

**Contact Details**

Tel:011 312 3393 and only if our land line is out of order 072 088 8986

Homepage: <http://www.icmsa.co.za>



Direction on Google map: <https://goo.gl/maps/qQi4kzrtnPAXZDZB8>

ICM industries

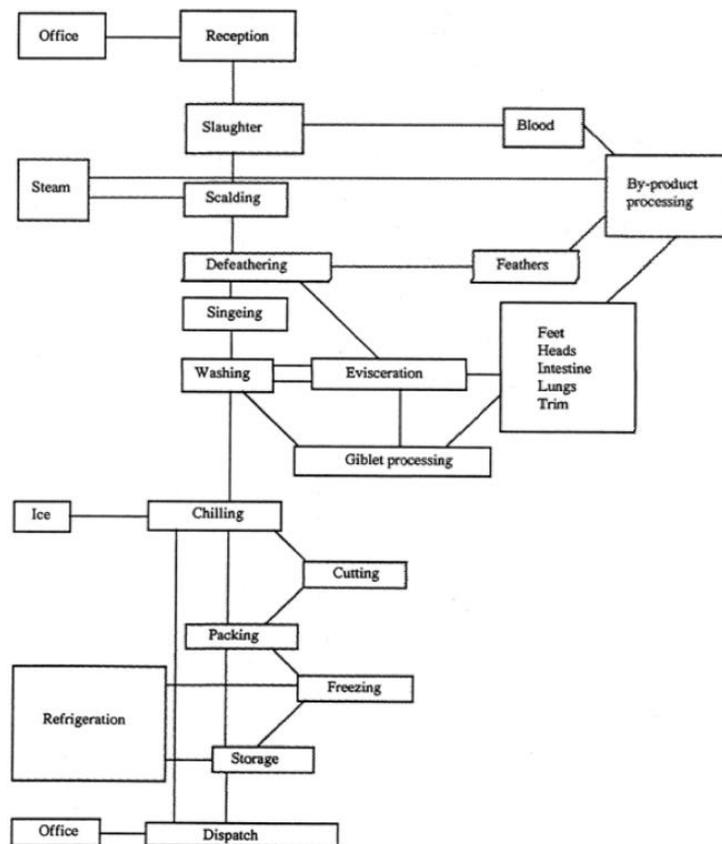
Midrand South Africa

For quote please send us email: [icm@lant](mailto:icm@lant) your e mail over the phone.

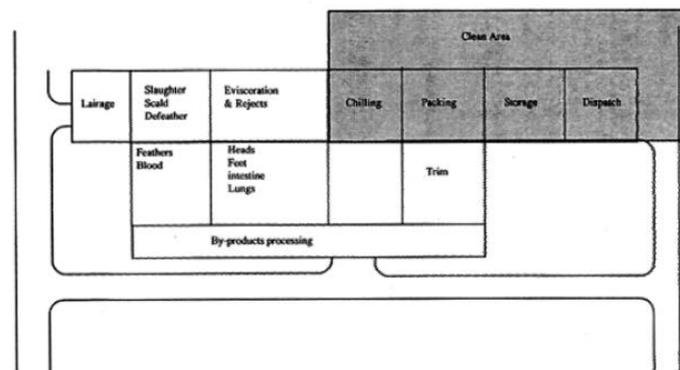
For orders over 3 machines you can receive



## Annex 1 Poultry Processing: Flow Diagram



## Annex 2 Separation of Clean and Dirty areas



## **ANNEX 3**

### **EQUIPMENT FOR POULTRY PROCESSING UNITS**

#### **Model 1 50 Birds/day: NYD**

Equipment summary

1. 4 Cone killing stand
2. Stunning/Sticking knife
3. Dry plucking machine
4. Holding table
5. Feather bins × 2
6. Mobile racks × 2
7. Wash hand basin × 2
8. Scale
9. Cleaning equipment/hose lines (High pressure power washer)
10. Insect electrocutors × 2
11. Electrical fittings
12. 12 Drainage fittings
13. Ceiling fans
14. Office equipment: Desk, table, chairs, filing cabinet, telephone etc
15. Changing room equipment: Lockers, benches, sanitary ware, showers etc
16. Laundry equipment: Sink, cupboard, clothes lines etc
17. Boot wash

Further details: Small scale poultry processing on [www.fao.org](http://www.fao.org)

## Conclusion and Recommendations

Poultry production and processing holds immense potential here in Mozambique. The sector can contribute to poverty reduction through job creation, as well as food security. Professional processing is part of the value chain which is not yet available on a larger scale here in Sofala. To meet all laws and regulations, efficiency, economies of scale and the stiff price competition in this industry, only big players can compete. This may be difficult for Young Africa Agri-tech, when we consider the location, the capital required, and the risks involved.

A small processing unit could however be a solution for us. Even though the capital needed would be rather small, the risks involved are still rather high.

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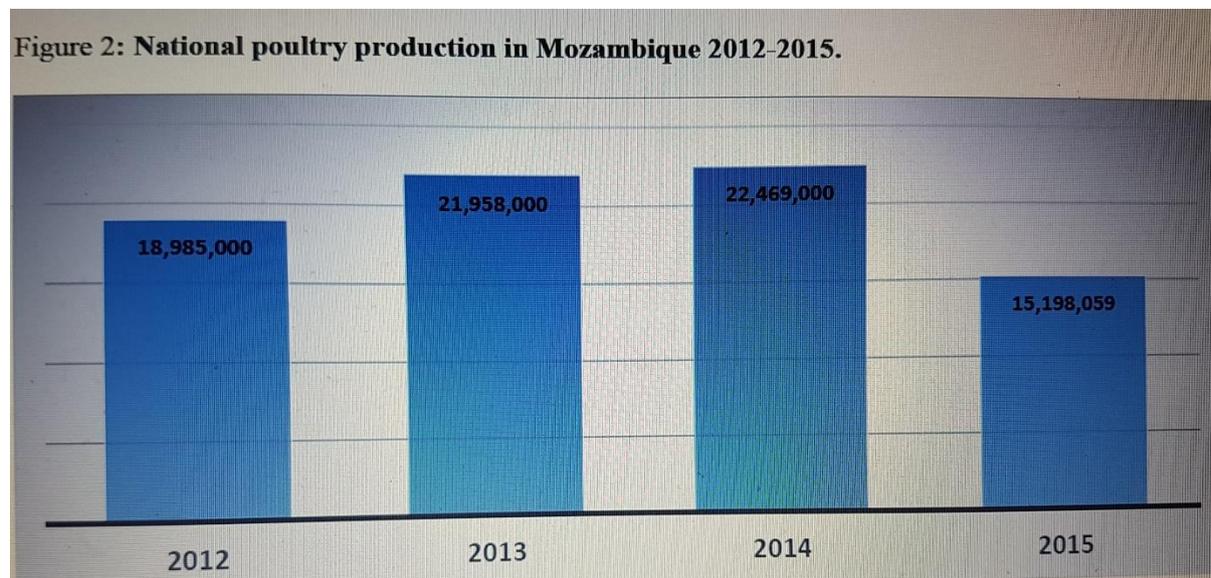
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## Annex:

### 1.National poultry production in numbers in Mozambique



Source: (in Bah El-Hadj. and O. Gajigo 2019) African Development Bank, Working Paper 309

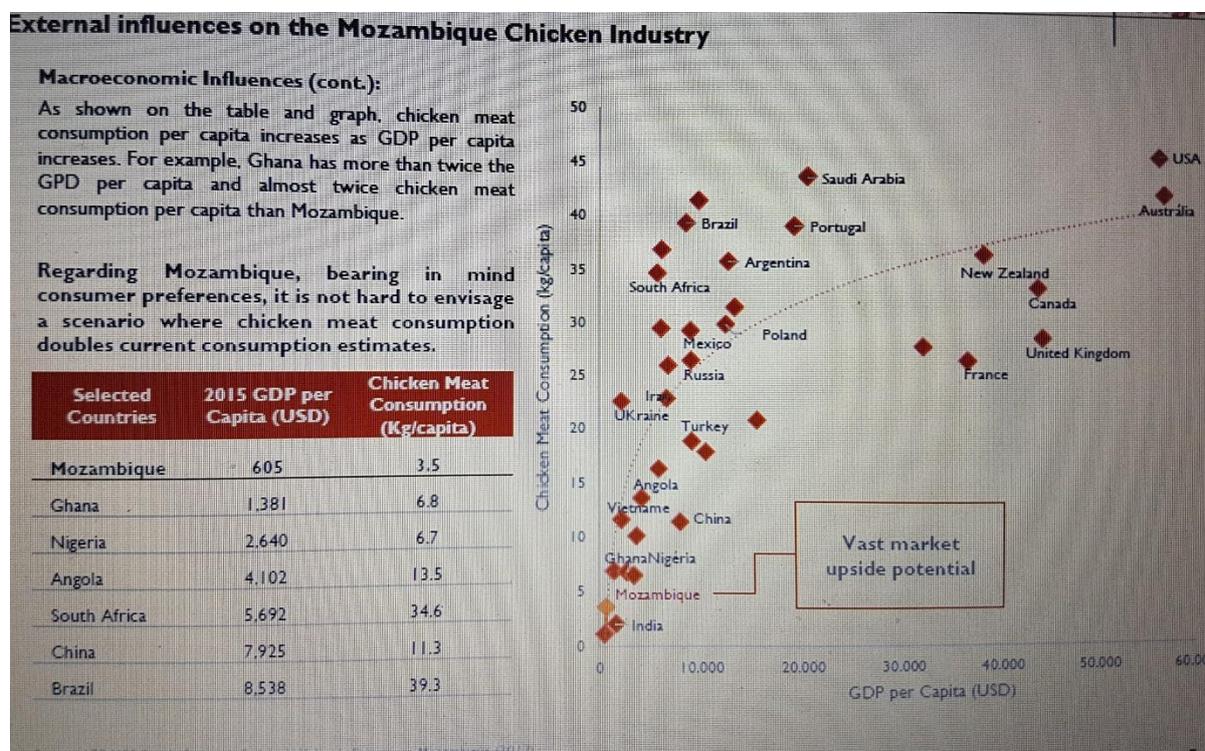
## 2. Distribution of Poultry Production in Mozambique

*Distribution of poultry by provinces in 2012 (10<sup>3</sup> birds), Source IAI, 2013*

| Region       | Province  | Chickens         | Ducks            | Geese        | Turkeys       | Guinea fowls   |
|--------------|-----------|------------------|------------------|--------------|---------------|----------------|
| North        | Niassa    | 660 829          | 86 580           | -            | 3 334         | 14 027         |
|              | C.Delgado | 1 198 005        | 135 949          | -            | -             | -              |
|              | Nampula   | 2 091 273        | 305 120          | -            | 6 316         | 50 727         |
| Centre       | Zambezia  | 3 939 257        | 235 400          | -            | 6 358         | 26 478         |
|              | Tete      | 1 305 810        | 45 664           | -            | -             | 16 085         |
|              | Manica    | 1 871 738        | 86 034           | -            | 27 494        | 98 988         |
| South        | Sofala    | 1 540 960        | 132 054          | 45           | 8 263         | 125 862        |
|              | Inhambane | 1 095 436        | 231 205          | 350          | 21 634        | 15 163         |
|              | Gaza      | 950 772          | 155 162          | 1 298        | 411           | 4 901          |
|              | Maputo    | 3 568 125        | 386 631          | 1 484        | 1 931         | 25 666         |
| <b>Total</b> |           | <b>1 822 205</b> | <b>1 799 799</b> | <b>3 177</b> | <b>75 741</b> | <b>377 897</b> |

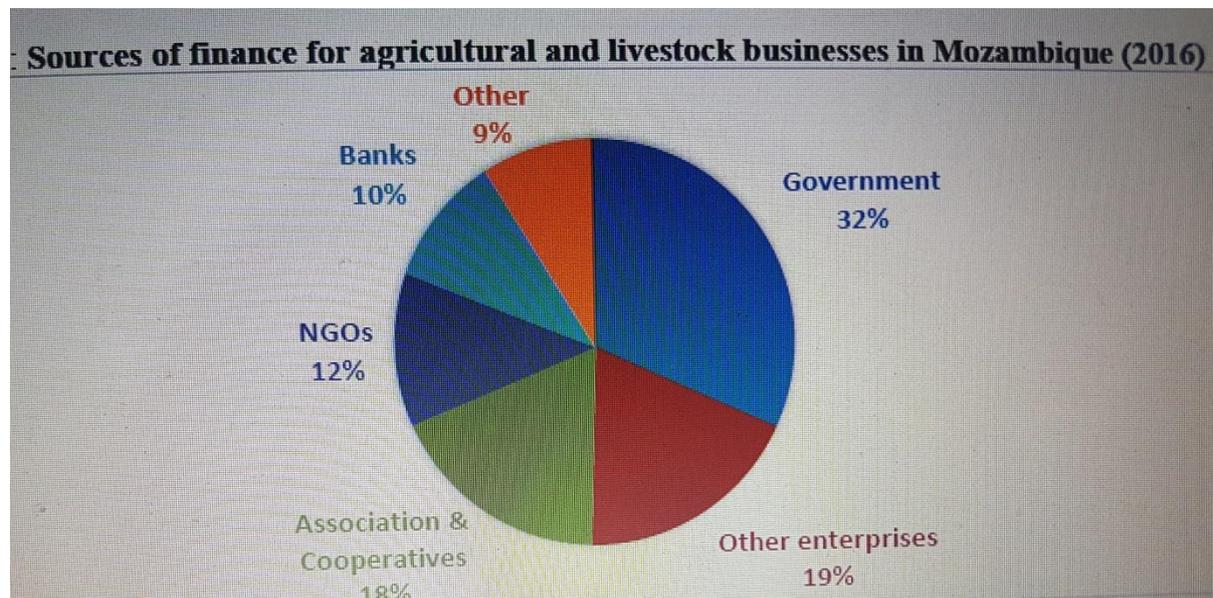
From Wageningen U 2016

## 3.External influences



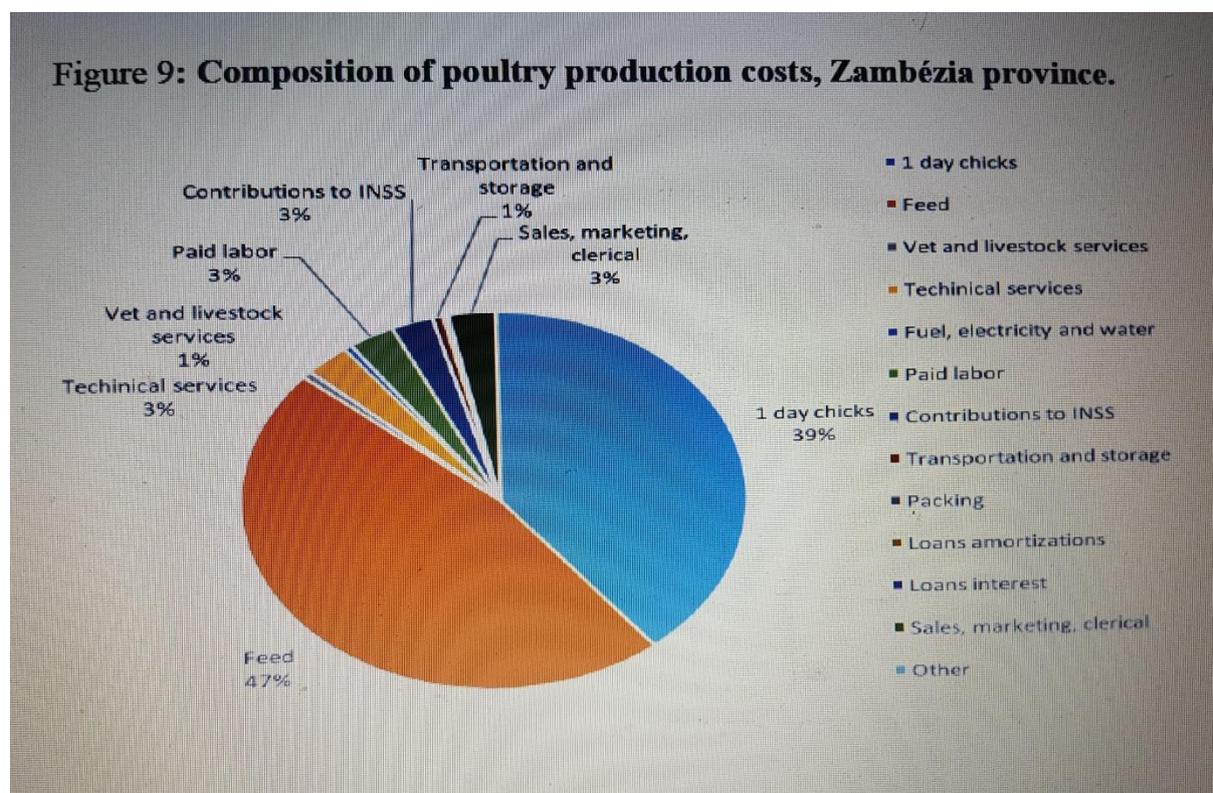
From Highest 2018

**4. Finance: Most livestock operations are financed by the government but NGOs finance 12%. This would be also the most likely source for Young Africa**



*Yearbook of Agrarian Statistic 2016, Mozambique (in Bah El-Hadj. and O. Gajigo 2019)*

**5. Poultry Production cost example**



*SOURCE: Yearbook of Agrarian Statistic 2016, Mozambique (in Bah El-Hadj. and O. Gajigo 2019)*

## 6.FAO Classification on Poultry Production systems

| Sectors<br>(FAO/definition)          | Poultry production systems       |                                  |                                  |   |
|--------------------------------------|----------------------------------|----------------------------------|----------------------------------|---|
|                                      | Industrial and<br>integrated     | Commercial                       |                                  | Village or backyard                       |
|                                      |                                  | Bio-security                     |                                  |   |
|                                      |                                  | High                             | Low                              |   |
| Sector 1                             | Sector 2                         | Sector 3                         | Sector 4                         |   |
| Biosecurity                          | High                             | Mod-High                         | Low                              | Low                                       |
| Market outputs                       | Export and urban                 | Urban/rural                      | Live urban/rural                 | Rural/urban                               |
| Dependence on market<br>for inputs   | High                             | High                             | High                             | Low                                       |
| Dependence on goods<br>roads         | High                             | High                             | High                             | Low                                       |
| Location                             | Near capital and<br>major cities | Near capital and<br>major cities | Smaller towns and<br>rural areas | Everywhere. Dominates in<br>remote areas  |
| Birds kept                           | Indoors                          | Indoors                          | Indoors/Part-time<br>outdoors    | Out most of the day                       |
| Shed                                 | Closed                           | Closed                           | Closed/Open                      | Open                                      |
| Contact with other<br>chickens       | None                             | None                             | Yes                              | Yes                                       |
| Contact with ducks                   | None                             | None                             | Yes                              | Yes                                       |
| Contact with other<br>domestic birds | None                             | None                             | Yes                              | Yes                                       |
| Contact with wildlife                | None                             | None                             | Yes                              | Yes                                       |
| Veterinary service                   | Own Veterinarian                 | Pays for veterinary<br>service   | Pays for veterinary<br>service   | Irregular, depends on<br>govt vet service |
| Source of medicine and<br>vaccine    | Market                           | Market                           | Market                           | Government and market                     |
| Source of technical<br>information   | Company and<br>associates        | Sellers of inputs                | Sellers of inputs                | Government extension<br>service           |
| Source of finance                    | Banks and own                    | Banks and own                    | Banks and private <sup>2</sup>   | Private and banks                         |
| Breed of poultry                     | Commercial                       | Commercial                       | Commercial                       | Native                                    |
| Food security of owner               | High                             | Ok                               | Ok                               | From ok to bad                            |

*Sector 1:* Industrial integrated system with high level of biosecurity and birds/products marketed commercially (e.g. farms that are part of an integrated broiler production enterprise with clearly defined and implemented standard operating procedures for biosecurity).

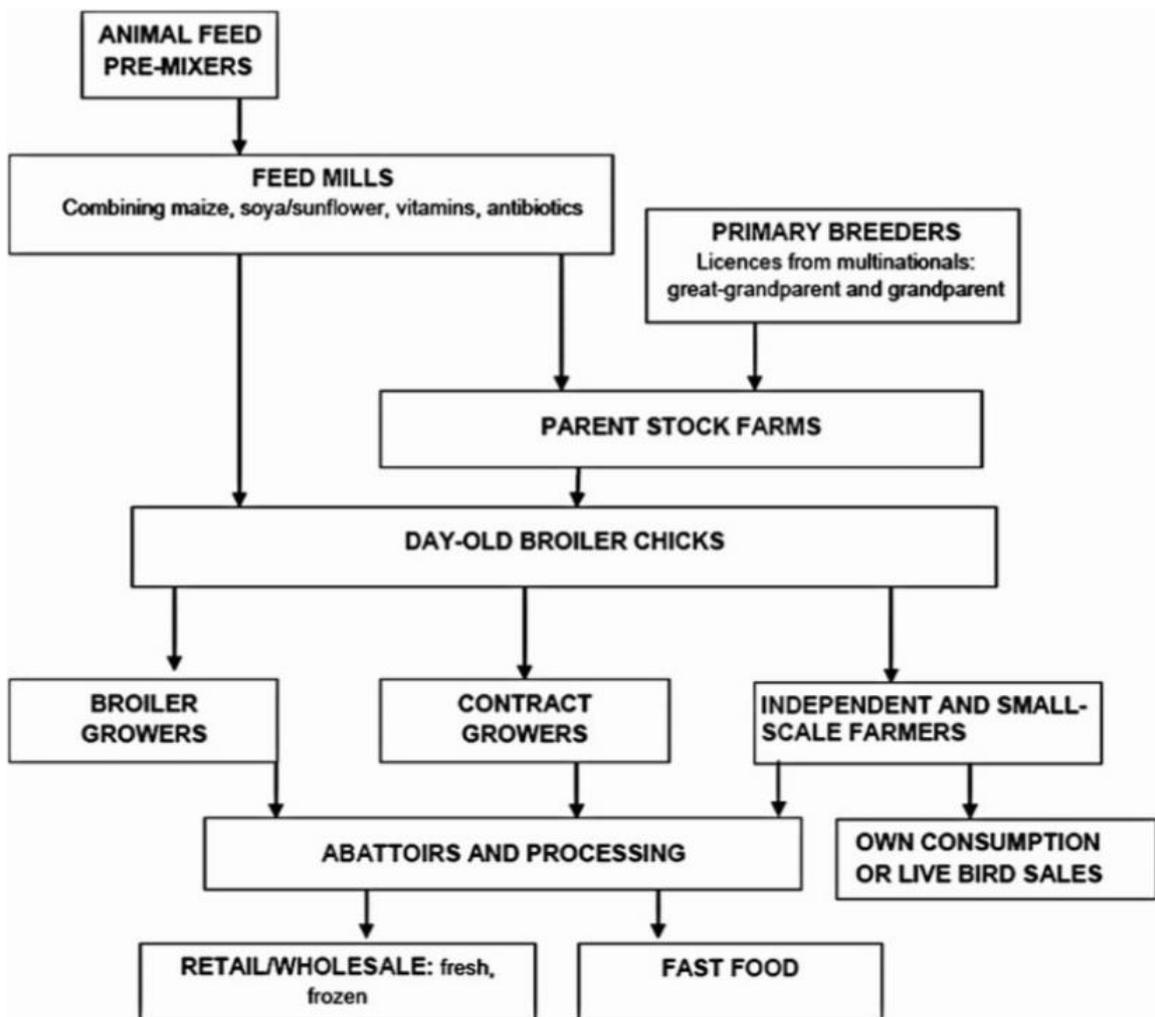
*Sector 2:* Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially (e.g. farms with birds kept indoors continuously; strictly preventing contact with other poultry or wildlife).

*Sector 3:* Commercial poultry production system with low to minimal biosecurity and birds/products entering live bird markets (e.g. a caged layer farm with birds in open sheds; a farm with poultry spending time outside the shed; a farm producing chickens and waterfowl).

*Sector 4:* Village or backyard production with minimal biosecurity and birds/products consumed locally.

## 7. Poultry Value Chain

**Figure 1. Poultry value chain (Source: Bagopi et al., 2014).**



(Bagopi et al 2014 in Phumumzile Ncube (2018))

### **Missing segments of the value chain**

Some segments of the poultry value chain are absent in parts of Mozambique. These can include veterinary services, hatcheries, feed mills, processing, and cool storage. Here in Sofala we have mainly a lack of processing facilities as well as veterinary services.

Veterinary services, including medicines and vaccination, play an important role in the output level and quality of poultry products. Official national data (IAI 2015) show that, on average, only 4.2% of poultry companies use vaccination services.

Despite the presence of a large number of households raising chicken for meat production, such veterinary services are absent. This is a critical element missing in the value chain. Of all the support services, rural provinces such as Niassa and Zambézia are areas in particular need. Without this service, chicken rearing becomes a highly risky and unproductive operation. As a result, chicken producers remain small, and the small-scale and low-productivity effects are propagated along the whole value chain.

The fact that these key segments along the whole value chain are missing suggests that the poultry industry in these provinces are unlikely to graduate from small-scale, low-productive family operations into employment-generating commercial businesses. (in Bah El-Hadj. and O. Gajigo 2019)

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