



Business Case: Breeder- Hatchery that Retail Day Old Chicks



Description of Business Model

A specialist operation rearing breeder/parent stock to produce hatching eggs of certifiable origin and variety. A portion of the eggs are sold as hatching eggs.

After incubation in a hatchery a portion are these are sold as Day Old Chicks to commercial poultry farmers and input suppliers who retail Day Old Chicks in outlying geographic areas.



Typical Entrepreneur

- A. Existing large-scale producers looking to vertically integrate by investing in their own breeding-hatchery facility.
- B. Hatcheries looking to specialise up the value chain by including hatching egg production.
- C. Brazilian hatching egg exporters looking to retain market share in Senegal, or alternately Dutch or other investors looking for a successful market entry strategy that allows them to compete with Brazilian Imports.



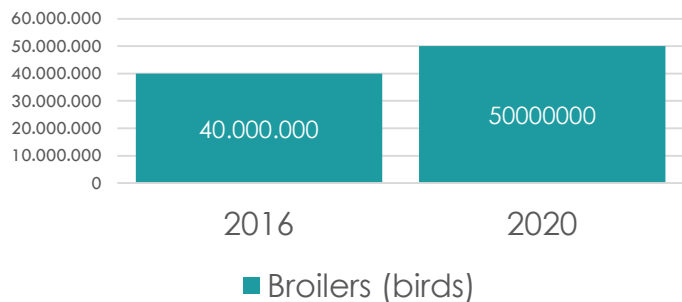


The Opportunity

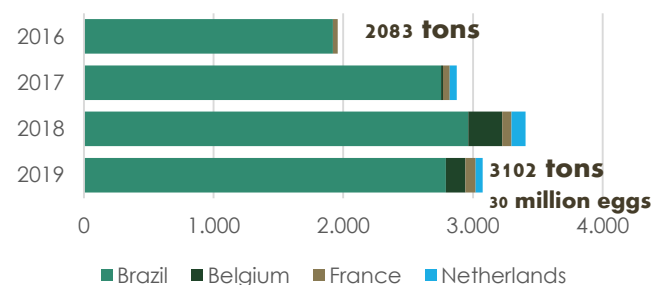
Market

- Broiler production in Senegal has increased by 25% since 2016. This has largely been made possible due to an increase of large scale commercial production that relies on imported hatching eggs. Small scale producers also make use of Day Old chicks, sourced from Hatcheries that rely on imported eggs-sourced largely in Brazil. Senegal is the #1 buyer of Brazilian hatching eggs globally.
- Local production of hatching eggs using imported genetic material is still its infancy. Nevertheless, it offers a significant cost advantage over imported hatching eggs.

Broiler Production Senegal, 2016 vs 2019



Imports of Eggs to Senegal 2016-2019, Tons



	450 Small Commercial Units	5-6 Large Commercial Units
Scale of production (per 45 days)	1000-2000 birds 1425kg-2850 kg	10000-120000 14520-171000kg
Production Method	Imported broilers Open air shed	Imported broilers Air-conditioned sheds

	Senegal	Ivory Coast
From local hatching eggs	*250 FCFA	**500FCFA
From imported hatching eggs	*440-650 FCFA	
Layers		700 FCFA

*Price of vaccinated day-old chicks
**Sourced from Poultry Sector Study Cote D'ivoire, RVO

Product or Service

The business model includes the production of locally bred day-old chicks using imported parent stock. As a result, day old chicks will be offered for sale to local poultry farms (primarily broiler, but layers can be included in the production model).

	Prices	Volumes	Notes
Day old chicks (broilers)	430 FCFA	1 million	this is in line with the market prices
Day old Chicks (layers)	550 FCFA		
Hatching Eggs	225 FCFA	4.68 m	

Rationale for investment

Large market potential

- Chicken production has been growing, which provides a growing market for hatching eggs. The market is reliant on imported genetic material. But local production of hatching eggs has only been achieved by Sedima. This has space for growth.

Cost Advantage:

- The cost advantage provides a reasonable opportunity to win market share. Hatcheries currently compete with a competition able to retail day old chicks at their buy in price for eggs. This has created significant pressure on their businesses. Local competitively priced hatching eggs would be advantageous and potential essential to their survival.

Ready Customers Base :

- 20 official hatcheries and 30-50 unofficial hatcheries exist in Senegal. They are centrally located along the coast near Dakar. This creates an existing customer base and create the potential for a simpler marketing system with reduced complexity.



Key Assumptions

Imported Parent Breeding Stock

The model assumes that imported genetics are used viz. **Cobb 500 broilers**. Layer hens can easily be accommodated in this model, with only a small change to the cost of the flock.

20 000 hens and 2000 cocks are assumed per rotation.

Sales Price

The prices are in line with the existing market prices for hatching eggs and day old chicks. The financial model is based on broiler hatching eggs. However layer hen day old chicks retail for 550 FCFA. This is +120 FCFA than pricing used in the model. However, the layer market is far more volatile. So we have used the steady and more conservative broiler market prices.

Volumes

The model assumes that 20 000 hens and 2000 cocks produce 7.2m eggs. However, only 80% of these are fertilised and will hatch after incubation. A portion are sold a hatching eggs (4.68m). The rest are incubated and sold a day old chicks (1 mio).

Manual Labour and Low tech

This model assumes that simple technologies are used. So, **manual labour** for tasks such as feeding, egg collection etc. Breeding is also not automated and relies on the cock mating with the hens in combined sheds.

Flock renewal every 14 months

The model assumes that the flock is renewed annually. The outgoing flock will then be sold on the meat market and be replaced with imported birds. This model assumed that the flock is renewed **every 14 months**. This allows for simpler operations. However, as the birds age, the laying rate declines. As a result some companies rotate the flock every 60 weeks. These “aged out” birds are sold for **1200 FCFA per bird**.

Infrastructure and Equipment

The model allows for an air-conditioned light-tight sheds, a generator to allow for continued power supply, incubators, specialised egg trays and heaters and brooders.

Staffing

5 Permanent staff are provided for – which includes an operations manager and veterinarian.
13 Technical workers are included for daily operations (vaccinations, cleaning, water provision, sorting etc).

Location: Thiés/Niayes

Commercial and large scale broiler chicken production is heavily concentrated in Thiés and along the coast, where the weather is suitable for year round chicken production. Locating egg production close to customers ensures that operations are simplified. It also allows to be close to the port, which is helpful in being close to the source of feed.

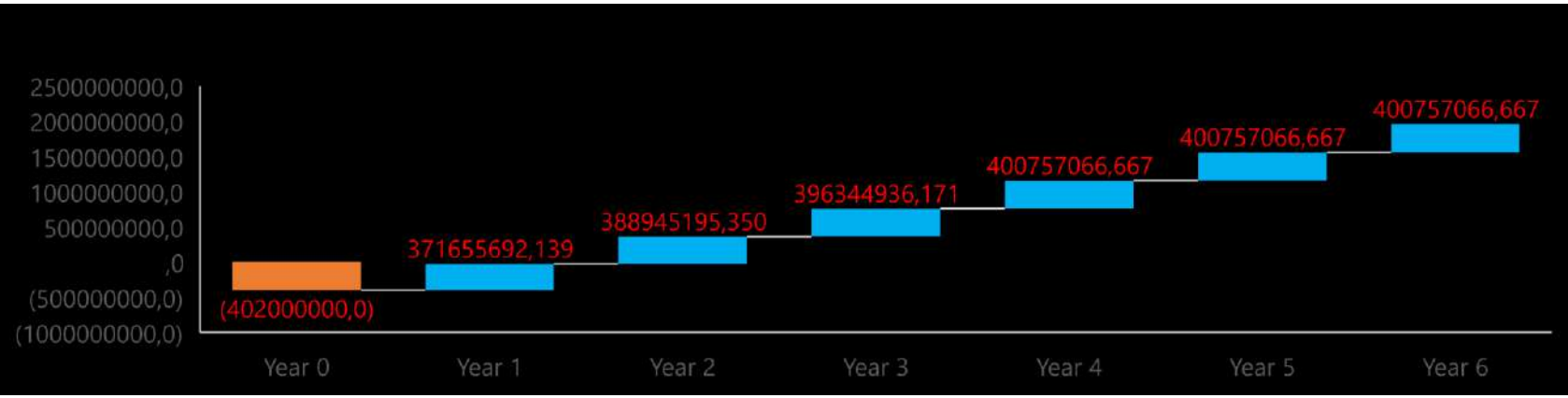


Gross Margins & ROI- Large Commercial Scale

Senegal: Hatchery Egg Farm Integrated Business Model (FCFA)						
Year	2020	2021	2022	2023	2024	2025
Revenues						
Hatchery Egg	936,000,000	936,000,000	936,000,000	936,000,000	936,000,000	936,000,000
Chicken	-	18,000,000	18,000,000	18,000,000	18,000,000	18,000,000
Day Old Chicks	440,000,000	440,000,000	440,000,000	440,000,000	440,000,000	440,000,000
Total revenues	1,376,000,000	1,394,000,000	1,394,000,000	1,394,000,000	1,394,000,000	1,394,000,000
Total variable costs	725,808,000	725,808,000	725,808,000	725,808,000	725,808,000	725,808,000
Gross margin	650,192,000	668,192,000	668,192,000	668,192,000	668,192,000	668,192,000
Total fixed costs	119,255,297	112,556,007	101,984,948	95,681,905	95,681,905	95,681,905
Total costs	845,063,297	838,364,007	827,792,948	821,489,905	821,489,905	821,489,905
Profit before Tax	530,936,703	555,635,993	566,207,052	572,510,095	572,510,095	572,510,095
Tax rate 30%	159,281,011	166,690,798	169,862,116	171,753,029	171,753,029	171,753,029
Net Income	371,655,692	388,945,195	396,344,936	400,757,067	400,757,067	400,757,067
Net Income %	27.01%	27.90%	28.43%	28.75%	28.75%	28.75%
Cumulative net income	371,655,692	760,600,887	1,156,945,824	1,557,702,890	1,958,459,957	2,359,217,024

Note1: the fixed costs are high in year 1 and 2 due to the investment loan repayment (212 mln FCFA) over 36 months.

Senegal: Hatchery Egg Farm Integrated Business Model (FCFA)							
Period	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Investment/Net Income	(402,000,000)	371,655,692	388,945,195	396,344,936	400,757,067	400,757,067	400,757,067



Note 2: The investment payback calculation includes the total capital investment and as well as the cost of investment credit repayment.



CAPEX Breakdown

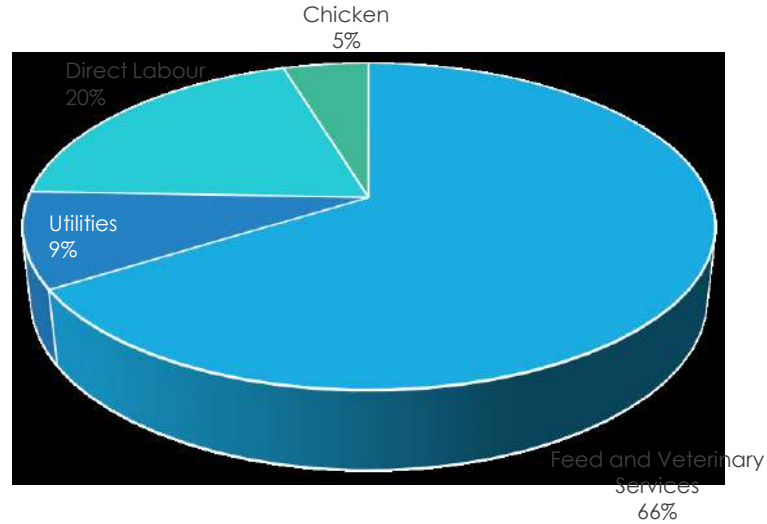
The project requires an investment of **FCFA 304,00,000** in assets for the following:

- Construction of the hatchery farm.
- Water pots and drinking system
- Air condition and sanitation system.
- Feeder system.
- Heater and brooder system
- Incubator.
- Generator.

Note 3: The largest portion in the capital investment is the construction of the hatchery farm with 46% of the total investment.

Post Type	# of Posts	% Share
Water pots or Drinking system	15,000,000	5%
Air condition and sanitation system	18,000,000	6%
Feeders	30,000,000	10%
Heater or Brooder	45,000,000	15%
Incubator	50,000,000	16%
Generator	6,000,000	2%
Hatchery Farm (including the administrative building)	140,000,000	46%

Breakdown of operational expenses



Specified Mechanisation Equipment



Available Financial Instruments

- Commercial Banks
- Microfinance Institutions
- Impact Investment Funds



Gross Margins & ROI- Small Commercial Scale

To enable a sensible scale up we've provided a view on a small- scale operation that produces 10% of the output.

This allows for a modular step up and for greater inclusion of small-medium scale producers. It also allows existing hatcheries to test the waters in breeding.

Senegal: Hatchery Egg Farm Integrated Business Model (FCFA) Small Scale Business Model						
Year	2020	2021	2022	2023	2024	2025
Revenues						
Hatchery Egg	93,600,000	93,600,000	93,600,000	93,600,000	93,600,000	93,600,000
Chicken	-	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
Day Old Chicks	44,000,000	44,000,000	44,000,000	44,000,000	44,000,000	44,000,000
Total revenues	137,600,000	139,400,000	139,400,000	139,400,000	139,400,000	139,400,000
Total variable costs	72,580,800	72,580,800	72,580,800	72,580,800	72,580,800	72,580,800
Gross margin	65,019,200	66,819,200	66,819,200	66,819,200	66,819,200	66,819,200
Total fixed costs	26,899,261	25,422,773	23,092,967	21,703,810	21,703,810	21,703,810
Total costs	99,480,061	98,003,573	95,673,767	94,284,610	94,284,610	94,284,610
Profit before Tax	38,119,939	41,396,427	43,726,233	45,115,390	45,115,390	45,115,390
Tax rate 30%	11,435,982	12,418,928	13,117,870	13,534,617	13,534,617	13,534,617
Net Income	26,683,957	28,977,499	30,608,363	31,580,773	31,580,773	31,580,773
Net Income %	19.39%	20.79%	21.96%	22.65%	22.65%	22.65%
Cumulative net income	26,683,957	55,661,456	86,269,819	117,850,593	149,431,366	181,012,139

Note1: the fixed costs are high in year 1 and 2 due to the investment loan repayment (57 mln FCFA) over 36 months.

Senegal: Hatchery Egg Farm Integrated Business Model (FCFA) Small Scale Business Model							
Period	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Investment/Net Income	(77,000,000)	26,683,957	28,977,499	30,608,363	31,580,773	31,580,773	31,580,773

	Prices	Volumes
Day old chicks (broilers)	430 FCFA	100 000 per year
Day old Chicks (layers)	550 FCFA	
Hatching Eggs	225 FCFA	468 000 per year



Note 2: The investment payback calculation includes the total capital investment and as well as the cost of investment credit repayment.



1

Imported breeding stock

The model requires that imported breeding stock be used to grow successive generations of breeding hens. Despite legal restrictions on the import of live chicken, breeding stock imports are legally permitted. However, permission must be sought from the Directorate of Veterinary Services.

Ensuring that you develop strong relationships with the parent stock supplier is essential. This ensures there is some genetic uniformity, that you can get a good idea of performance over successive rotations. Because a supplier has a consistent vaccination regime, you are also able to diagnose diseases in the flock with greater insight and accuracy.



2

Competitive Price & Quality

The model assumes that they breeder is able to compete on price when compared to the current low-cost supplier (250 FCFA). However, even with low prices there are several hatcheries who retail day old chicks at significantly higher prices. (420 FCFA upwards).

This model thus allows for the most aggressive pricing, and outcompetes imported hatching egg prices, which are 250 FCFA.

It does however require a good control on quality and that the broilers and layers match the imported hatching eggs for growth rates or laying rates.



3

Good Technical and Operations Management

Breeder operations are a fair deal more technical than running a hatchery. It requires close attention to smooth operations and to the health of the parent stock. Not doing so affects the growth rate of the broilers, spread of disease etc. Having tight control of vaccination regimes, the weight of the birds and the feed rations are all important ingredients in ensuring that the business can be successful in reality.



4

Organised supply chain

The annual rotation of the flock needs to be especially well managed. This requires that the operations managers place orders and receive the replacement birds timeously and that these comply with regulatory controls and checks. This is essential for a well timed, smooth rotation between flocks.



5

Optimised feed & feed rations

Selecting an appropriate feed ration for the breeding stock is an important component of a successful breeding operation. Over- or under-fed birds underperform.

This model assumed that 100g-200g of a feed premix is consumed per bird per day. This should be developed with a local feed mill to ensure that the rations are optimized in line with the chief veterinarian’s recommendation. This will need to be tweaked as an optimal blend is developed for local conditions.

Linking up with a feed mill to develop and tweak the feed ration over time will be important. There are 8 feed mills in Senegal, however Sedima, Olam, NMA Sanders and FKS Mills account for the bulk of the market. These are potential suppliers with whom to develop stronger ties.

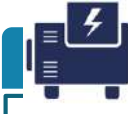


7

Regulatory Compliance

The operation has a number of regulatory issues. Firstly, the import of parent stock will be carefully controlled. The birds are also subject to quarantine.

Secondly, the continued health of the flock is essential to ensure regulatory compliance as well as consistent productivity. The importer will need to work with regulatory authorities viz. the DVS to get required approvals.



6

Energy Back-Up System

A successful hatchery and breeding operation requires light tight sheds, air conditioning and consistent temperatures in the incubators. To allow for this the model assumes that a generator is available to provide energy when the electricity supply is interrupted.



8

Sector Skills and Service Development

The strong growth in the poultry sector means that there are emerging shortages of skilled labour. An important investment needs to be made at the sector level to close some of these gaps. This will potentially require investment in training courses for specialised poultry skills, exchange programs etc.

Attracting an investor, with experience in breeding, building a close partnership with the genetics supplier and or attracting skilled staff from abroad are all some of the potential mechanisms to avoid learning by doing. A trial and error approach is risky in terms of the financial viability of the business. But it can also have an impact on the sector as a whole, especially if poor genetics, or diseases are unintentionally introduced.



Risk Analysis

Dumping from Brazil

Since 2015 Senegal has consistently been the largest buyer of Brazilian hatching eggs both by value and volume. In 2019 this represented 27% of all of that country's hatching egg exports. A response from Brazil is to be anticipated.

Supply Chain breakdown

Keeping the business in consistent operation is particularly important. Failure to get critical inputs delivered on time and in full can have disastrous consequences to the operation.

Disease

Disease outbreaks can jeopardise an entire flock and can be spread to other farms. It's critical that this is well controlled.

Market Slow Down

The current market has shown a tendency to expand production ahead of demand. It's important that the breeder paces investment and development strategies to ensure that they do not outpace demand for local hatchery eggs.



Risk Mitigation

Brazilian Investment

Conduct investment promotion in Brazil to create partnerships with Senegalese companies, or encourage independent Brazilian-owned hatching egg production in Senegal.

Competitive local production

Ensure that hatching egg production is cost-competitive to be able to offer competitive prices on the local market. Ensure that the local marketing of eggs and customer relationship management is strong to be able to create value to hatcheries.

Dedicated genetic material supplier

Ensuring that the supply chain for parent stock is consistent both in quality and timing is an important ingredient. The investor will need to build a relationship with a technical, expert in grand parent stock production who has exceptional control of the quality and health.

In-house Veterinary Skills & Disease prevention program

Close control of bird health, feed, productivity and even the rotation cycle for the clock are all in the hands of the veterinarian. To manage risk this should be brought in-house. A dedicated veterinarian and assistant are important staffing positions. It's essential that there is continued training to keep abreast of new developments. The team should also liaise with the DVS and the various stakeholders to keep aware of developing disease outbreaks, performance of the broilers and layer hens on the farm etc.

Poultry production

The investor might want to consider developing mechanisms to manage peaks and troughs in demand. For example, could they consider periodic rearing of broilers? Could they develop close ties with preferred poultry farms with access to abattoir facilities to smooth out demand?



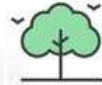
Economic & Social Impact

Food security:

- Marine fish form the foundation for protein consumption in Senegal. But increased pressure on marine stocks have been increasing food insecurity for Senegal. Cost savings in production could be passed on to shoppers making poultry and eggs affordable to more Senegalese.

Competitive local production:

- The sector is currently protected with import bans. Should these be lifted this would leave local producer vulnerable. This could affect the more than 500 000 direct and indirect jobs provided by the sector. Competitive day-old chick production is one mechanism of improving competitiveness & securing livelihoods.



Environment Sustainability

Carbon Footprint

Hatching eggs are currently sourced from Brazil by sea freight. Local production thus has an impact of reducing up to 119 shipping containers of hatching eggs. (assuming 26 tons per container).



Women & Youth

- The largest impact of developing a lower cost alternative for day old chicks is the potential impact on small, backyard poultry producers.
- Women tend to be central to this production. Being able to purchase a lower cost day old chick provides a potential increase in profits.
- Growing the availability and affordability of chicken could have a knock-on effect that increases the overall size of the sector.



Knowledge Transfers

The Netherlands is a global leader in broiler production. This integrated model of production means that the sector holds deep insight in to the technical production of hatching eggs.

The country is an exporter of not only the systems and inputs for production, but also of knowledge.



Commercial Interests

The Dutch poultry sector has embraced the idea that it's simply not possible for Dutch producers to produce the world's chicken. As a result the sector has a strategic interest in partnering with producers in countries around the world to expand local production.



Technology

The Netherlands is amongst the world leaders in several technologies required for professional breeding and hatchery programs. This includes being leaders in providing the parent stock.

As a result, this is a key potential partner for the development of this segment of the value chain.



State Institutions, Universities

Directorate of Veterinary Services (DVS).

The quality of imported hatching eggs is managed by the Directorate of Veterinary Services (DVS). They issue the import permits for hatching eggs and are responsible for quality check on the eggs. They are also responsible for managing the veterinary services in Senegal, which includes control over vaccinations and disease outbreaks. This will be a critical stakeholder in being able to become certified for local hatching egg production and for continued safe, legal operations.

Universities and Training Colleges

Working to develop curricula that will expand practical skills in the sector is important. For successful continued breeding more technical skills will need to be developed. This should be considered in designing tertiary curricula.



Private Sector

Banque Agricole (CNAAS), Banks

Agri-insurance is an important tool for managing risk. The private banking sector is the most likely source of solutions.

Feed mills

Quality inputs specialised for breeding stock is critical for this model to be workable. Working with local feed ingredient importers and feed mills will thus be important to getting good yields from the breeding stock and ensuring quality hatching eggs.

SEDIMA

A powerful local integrated producer. They could be a willing investor or customer for local hatching egg producers.



Professional Associations & Cooperatives

IPAS

This is the lead professional association for poultry production. They have made great inroads in to organizing the sector. It has participation from the largest poultry producer in Senegal, SEDIMA, who at present holds the position of general secretary. The association has 4 divisions- producer, feed suppliers, hatcheries and service providers. Producers thereafter have 2 separate sub-divisions. 30 Large producers work together in one branch, with the balance of the producers working together in another. This is a critical body for lobbying the state, securing support from stakeholders and engaging with potential clients.