REPORT

Senegalese Poultry Processing Industry

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1. Introduction.

The “Fédération des Acteurs de la Filière Avicole”, hereafter referred to as FAFA, has been recently formed (early 2002) as a Federation representing several important segments within the Senegalese Poultry industry. FAFA is a formation of 4 Associations: - AAD, AVIDAK, ASCOPAL and COTAVI.

These associations represent the chicken rearers of day-old chicks, AAD (male membership) and AVIDAK (female membership), the commercial / sellers of poultry, ASCOPAL and the Technical Support to the industry (e.g. veterinary supplies) COTAVI.

The chicken breeding, egg incubation, and the chicken feed industry are not at present members of FAFA.

2. Background

FAVA has quickly identified structural, commercial, and product quality difficulties within their industry that need to be addressed and have sought professional support via the Dyna organisation. Dyna in their turn have sought international professional expertise and experience in the person of Mr. C.E. Bonnett. This is his report and addresses the major problems within the industry and recommends initiatives to be taken by FAFA members to redress these problems.

3. Present situation of the Poultry Processing Industry

3.1 Size of the Market

3.1.1 Poultry meat consumption

Statistical figures concerning the poultry industry exist and in the “Statistiques 2001 sur la Filière Avicole Moderne” (Fevriere 2002) the total number of chickens domestically produced in Senegal was c. 5.5 million. This figure has been translated to equate to a consumption of c. 7,700 tons pa. (average selling weight = 1.4 kg).

This figure represents the number of chickens produced by “industrial or basic semi-industrial” methods – chickens raised in the “farm yard” are not included.

In addition to this figure FAFA suggests that there are approximately 11,700 tons produced on smallholdings and households throughout Senegal.

The importation of chicken meat, both legal and illegal, is estimated to be in the region of 6,000 tons p.a. (all info. ex FAVA).

It is assumed that all these chickens (both broilers and egg-layers) are all consumed on the Senegal local market and therefore amounts to a total
consumption in the region of **25,500 tons per annum**. This translates to a consumption of **c. 2.49 kg per capita per annum**.

Comparable consumption figures of neighbouring countries in Africa have not been available, but to put this consumption figure into a comparable context with other statistics, the consumption per capita in some other areas are as follows:

- USA - 45 kg per year
- EU average - 22 kg per year
- Kosovo - 12 kg per year

Although comparable figures from like nations in the region would give a more realistic picture than the above statistics, it is assumed that the consumption of poultry meat will continue to grow in Senegal, mirroring the world-wide trend of higher consumption levels of poultry meats.

### 3.1.2 Significance of the Dakar region

The number of broiler chickens “industrially” produced in Senegal is in the region of 5.5 million birds pa. (see Yearly Statistic - 2001). Members of FAFA indicate that approx. 80% of these are produced within the Dakar region, ( = 4.4 million) making it a very important area for the chicken industry as well as being located near the region of the highest consumption.

Dakar’s population is noted as 2.5 million inhabitants giving a total local market volume of approximately 6,225 tons per annum. With a retail value of approx. 1800 cfa per /Kg this therefore gives a local market value of 6,225,000 kg x 1800 cfa = 11,205,000,000 cfa !!!!

### 3.2 End-Product Quality

There are many aspects that constitute product quality.

Some of the major areas are as follows:

- Breed of chicken
- Animal feed quality and conditions of rearing etc
- Live bird transport and processing techniques
- Post-slaughter handing conditions
- Products and their presentation
- Distribution
- Products and their presentation
- Point of sale conditions
Having carried out due diligence visits to all aspects of the industry in Senegal, the major elements which will contribute to the improvement of end-product quality is the development of modern hygienic/processing slaughtering facilities and the corresponding food chain of correct product handling and display right up to the point of sale.

3.3 Chicken processing

The present situation of chicken processing is so called “Traditional”. This can be translated into modern poultry processing as non-existent in any form of industrial scale.

The slaughtering of chickens takes place in the so called “tuerie” which is an area where the traditional slaughtering operations take place. This is an area specifically used for this operation in a town or a space in the market (Bana Bana) in the open air with, no further specific facilities regarding floors (dirt), walls or ceilings, doors, etc. Some very basic slaughtering equipment is sometimes present: namely a warm water scalding bath, heated usually by gas, a de-feathering device, and a table for evisceration. There are no chilling facilities. Washing facilities were not observed. There is virtually no further processing (cutting-up) of the carcass.

The chickens are normally slaughtered at night / early morning when the temperatures are a little cooler and then transferred and sold in a warm condition the next morning on the market. This system of slaughter is traditional in Senegal and is practiced throughout the country.

There are absolutely no facilities for hygienic processing in order to produce an acceptable quality level end-product.

3.4 Distribution Channels and market knowledge

3.4.1 Traditional sales – “Bana Bana”

The present situation indicates that there is no organised distribution or sales system in Senegal. The processing of chickens is carried out either in the “tueries” or in the markets (Bana Bana) and this is done solely on an individual basis. There is no body or organisation co-ordinating the sales demands from the market place on the one hand and the supply of chickens on the other. The producers have scant knowledge of the distribution and even less information on consumer demands or the growing changes in consumer habits.

As figures are not available, it is assumed that the vast majority (85% -90%) of chickens are sold via the local Bana Banas. This is the traditional manner in
which the Senegalese market has operated, and it is also assumed that this type of outlet and trade will continue well into the future. There are few elements present which will force a change in the traditional habits passed down through generations.

Experience has shown that in other countries where this type of sale of fresh meat and poultry has been carried out in the past, (e.g. Lithuania and their “Bazars”) it has been the actions of the Government / Public Authorities that have forced change by adopting and enforcing legislation which allows the sale of fresh meat and **poultry products ONLY under chilled conditions**. This has changed whole strategies within the industry in these countries.

It would seem probable that the old methods in Senegal will only change very slowly, and only by enforceable legislation will change occur to more hygienic and higher quality poultry products in the majority of outlets. (Bana Bana)

### 3.4.2 The emergence of supermarkets

However there are changes taking place in the market. There are supermarket chains operating (eg “Score” - “Hyperscore” ) and these outlets are providing products which are sold under chilled conditions and some products are appearing under a brand name. However, only one operator has been identified (Mr. Pizano – product “Le Fermier”) as supplying the supermarkets with a branded product. It can be assumed that this supplier has some form of sales/logistic organisation enabling him to supply these outlets.

### 3.4.3 Changing customer requirements

Due diligence field work during this mission and the knowledge of increased volumes of imported frozen chicken thighs has identified a growing demand for chicken cuts as compared with the traditional whole chicken. This is especially true of the Dakar region where the demographic distribution is apparently different from the rest of the country – there are very many more individual, single people within the purchasing public that require smaller portions of food products, rather than the traditional larger “family” portions of the past. This expresses itself in the chicken industry as cuts of chicken rather than the whole bird.
4. Future developments

4.1 Market Growth

Seeing that the present consumption rate is relatively low (c. 2.49kg per capita/pa) it would seem to the expert that this consumption rate will increase in the future.

There are several factors that lead to this conclusion:

- There is a steady population growth in Senegal. This is an important and positive aspect when dealing with food consumption
- There are a large number of young people in Senegal, who have somewhat different eating habits to those of their parents. This trend will probably continue.
- There will be a growth in supermarkets and other more “sophisticated” outlets, although the Bana Bana will be in existence for many years to come!!
- Poultry production must become cheaper to compete with eventual imports. This should reflect in a lower retail price therefore making the purchase of poultry more attractive
- There will be a wider choice of better quality poultry products available on the market
- Other markets indicate that poultry products are an attractive alternative to other meats such as beef, in which world-wide consumption is decreasing.

4.2 Poultry production

It is thought that rationalisation amongst poultry producers will take place. This will probably mean that there will be a trend to larger capacity units and units of 10,000 hens will become the standard rather than the exception as to-day. There will be pressures to become more efficient and operate as low-cost producers. The bulk purchasing of food (more producers buying together to obtain better prices) will become standard commercial practice and pressure will be upon suppliers of day old chicks to reduce their prices.

There are already rumours in the country that a large chicken feed concern is contemplating setting up a large number of farms at 10,000 hen laying capacity and making plans to invest in a large capacity abattoir to process these ‘spent’ hens.
4.3. Poultry processing

If there is an increase in consumption (which this report thinks is a real possibility if there is a decrease in price and an improvement in quality) then there will developments into more sophisticated processing.

To illustrate this point:

If for the sake of argument that the pro capita consumption of poultry meat increases up to 5.0 kg per year, what will this mean in processing / slaughtering facilities?

If the population remains stable at 10.0 million inhabitants, (It is forecasted to increase ) what numbers of chickens will needed to be processed etc?

10,000,000 people x 5.0 kg pa = 50,000 tons pa

50,000,000 kg / 1.4 kg per chicken = 35.700.000 chickens

35,700,000 chickens pa / 52 weeks = 690,000 chickens per week

To slaughter this amount in a “modern low capacity slaughterhouse” at say 1000 chickens per hour = 1000 x 85% machine efficency x 8hr x 5days = 32,000 per week.

Therefore IF the whole industry were to slaughter in this manner, there would be a requirement of 690,000 / 32,000 = 21 slaughter houses at this capacity !!!

Therefore it can be assumed that although these calculations are theoretical, and there are many calculations possible on capacity utilisation etc (see later paragraph 5.1.7 ) there will be a need to invest in slaughtering facilities in the future. Even if the figures are wrong by 100%, a serious investment in poultry processing will still be required if the industry wants to develop and improve its standards and quality to meet those of other developed economies.

4.4. Distribution and retailing

Distribution channels and consumer habits will continue to change as there is a steady improvement in the Senegalese economy and purchasing power. This means that there will be a greater demand for better quality/presentation/variations in poultry products. Chilled distribution will become the industry standard and chilled retail outlets will also become common place. There are signs that this is already happening. There will be a growth in more sophisticated distribution – some supermarkets are already carving a “niche” for themselves in the market place. There is a large commercial development planned for the outskirts of Dakar – “Les Quatre C” -
scheduled for opening in October 2003 with 200 shops and boutiques, cinemas, fast food outlets etc. All these developments are indicators of changing patterns in distribution and retailing. These developments in distribution and retailing will be the major influencing factor on the future structure and functioning of the poultry industry.

5. Recommendations, initiatives / actions to be undertaken:

The “traditional open-air method” of poultry slaughtering has been identified as basically no longer acceptable in Senegal. It is quite understandable that this process has remained “untouched” for so long, especially as the alternatives in such economic circumstances have been very limited indeed.

The increase in frozen imported chicken products over the last few years has had an awakening effect within the industry!

“**Improve quality and choice of our products or there is a very bleak outlook for the industry**”

Therefore, the industry in the form of the FAFA membership are wishing to progress to the next stages of producing higher quality domestic products. It has been noted elsewhere in this report that there are also changes and developments taking place in the market place, and these too are forcing the industry to adapt and improve the quality of products that are being offered.

There are several actions which will lead to the improvement of quality products to the consumer but the **major two and by far the most important** are the following:

The improvement in processing / slaughtering

and

The development and improvement in distribution and “point of sale conditions”

**5.1 The improvement in processing / slaughtering**

Starting from the position in which the industry finds itself to-day, there are basically two ways in which the industry can develop. Namely to take a small
step forward and develop into the “tuerie modern” - or embark on a larger scale improvement and develop into “semi-automatic slaughtering lines”.

5.1.1 “Guidelines and Recommendations”.

In which ever direction the Senegalese industry develops in the future, and it may well take steps in both directions depending on the players involved, there are some “guidelines” or “things to be taken into consideration” that need to be considered when addressing slaughtering opportunities.

They are as follows:

- location of slaughtering facilities should always be near to the live chickens when ever possible (cheapest transport to and from processing facilities and better for animals)
- building processing facilities is normally an expensive business. If suitable premises can be found and are commercially acceptable, then at the first stage of development, hiring / renting a building and modifying it is regarded as a prudent step
- consider using portable chillers/cold store space rather than construction
- if the permanent construction of chillers and or cold stores is planned, then carefully consider potential future expansion plans to avoid costly demolition / re-constructing work at a later stage!
- any buildings (new or existing) used for this operation must be suitable for producing food for human consumption. Major considerations are:

  i) buildings must be able to be kept clean including washable floors, walls and ceilings!
  ii) floors have to strong enough to take “heavy” wear and MUST be able to be cleaned and have water running away – NO POOLS OF WATER!
  iii) windows are OK – but keep them to a minimum
  iv) keep doors to a minimum too– and do not allow people in the facility who have no right to be there!!
  v) lighting is important where manual work has to be carried out
  vi) ceiling height of c. 3.5 metres is ideal
  vii) rectangular building is best suited for good product flow – principle is : “chickens in one end and product out the other”
  viii) rodents, animals and birds must be kept out of buildings
• Make sure there is a good supply of potable water
• See that there is electricity that can be easily connected
• ALWAYS get written permission from the Government or local authority for using the premises as a chicken slaughter house BEFORE any commitments are entered into!
• Don’t forget to install places for personnel to change and wash their hands
• Make sure you are allowed to work at night time
• Make sure there are adequate roads to and from facility
• Make sure you can safely secure the building

5.1.2.

“What sort of technology and capacity do I want to install?”

This is the question that all poultry processors face when they are beginning. This is always a difficult question to answer. There are so many parameters that play a part in such a decision but the only true answer must come from the market place!! The true economic analysis of this dilemma is decided by asking the following questions :-

“What volumes are going to be sold, at what quality level, and at what price range within a certain time frame or horizon”!!

When these “targets” have been decided ,which are often very difficult to assess, then the next step is to see by what means,( own production, 3rd party manufacture, import, etc.)..... can these targets be met !.

Seeing that in Senegal there are few guidelines or information as to what the market really is, it will be the ability to raise sufficient funds for poultry processing that will be a dominant feature on determining which type of equipment can /will be installed.

It must be stressed again that the poultry processing industry is volume based – this means there are economies of scale with slaughtering / processing equipment, and if sufficient funds can be obtained to invest in semi-automatic equipment, then this would normally be the best step in the industrial development. This is of course PROVIDING the investment it is well managed from the procurement of chickens to the point of sale – this is of the up-most importance – a slaughtering facility which has no chickens or cannot sell the end product is hardly likely to be a financial success!
5.1.3 The different stages in poultry processing

There is one **GOLDEN HYGIENE RULE** that applies to ALL food processing:-

“DIRTY PROCESSES / AREAS must be kept separate from CLEAN AREAS”

In other words, during food processing, or in this case, chicken slaughter, the areas where slaughter, de-feathering and evisceration take place must be separate from each other and above all, separate from the finished washed carcass!!

There are **5 basic processing areas** that need to be separated in poultry processing:

**Area 1**
- Bird reception

**Area 2**
- **De-feathering**
  - Neck cutting
  - Bleeding
  - Scalding
  - Plucking

**Area 3**
- **Evisceration**
  - Manual evisceration
  - Manual giblet removal and processing
  - Carcass washing

**Area 4**
- **Pre-cooling / packaging**
  - Carcass chilling – (water + ice)
  - Carcass drying / dripping
  - Packaging – manual - whole birds in plastic bags
  - Proportioning – manual hand cutter or saw
  - Cartoning / palletising

**Area 5**
- **Storage and Despatch**
  - Storage : chilled max. + 4 C or deep frozen - 25 C
  - Despatch
These are the basic steps in chicken processing and depending on the level of mechanisation, but most steps can be done manually ie: “Tuerie Modern” or progressively by machines ie: semi-automatic / fully automatic

Here below are explained the two basic options.

5.1.4 .“Tuerie modern”

A brief description of this possible future development can best be described as “using the same type of equipment as now, but create the processing environment to produce higher quality products”.

This means that the present methods of processing/slaughtering will have to be improved with newer processing machines, lay-outs and with higher hygiene standards. Slaughtering will also have to be performed within buildings that are suited to the production of human food products.

This is a major step, for many of the “machines” used now in the traditional methods are little more than home made pieces of equipment that “do the job” but little else.

The development of the present “tuerie” into a “tuerie modern” is a step which can be made provided the “guidelines” are followed as outlined above (5.1.1).

The “new” facilities / machinery that is required in such a facility are as follows:

**Slaughtering :**

- An area that can be separated from processing for the reception of birds. This does not have to be large, but should not be “open’ to the rest of the processing – remember the rules above!

- A slaughtering / bleeding device - normally fitted with inverted cones where the chicken is entered head first and in a downward movement so leaving the neck protruding for easy neck cutting and subsequent bleeding

- A trough for blood collection

- A scalding bath with hot water – gas fired is ideal with a thermometer control

- A “feather- plucker” which removes the feathers
- Simple evisceration hanging hooks/devices/tables where care must be taken to avoid contamination with the outside of the carcase.

- There should be enough containers (plastic) for the waste products (feet, heads, intestines, gall bladder, etc) to be deposited before removal from the building.

- The removal of gizzard, liver and heart should be done carefully. The preparation and washing of these organs should be done in another area of the process floor away from the carcasses.

**Carcass washing and pre-chilling**

- After this evisceration, the chickens should be sprayed with cold water to remove any remaining elements of blood, waste, dirt, etc. and then transferred to a cold water bath, ideally with constant running water, to bring the temperature down from +39 oC to at least the temp of the local water. The addition of ice will add to the benefit of a quick-chilled carcase. This is called pre-chilling.

- The ideal carcass temperature is +4 oC. This temp. is required to stop/hinder the growth of spoiling bacteria which affect the overall quality of the chicken. The length of this pre-chilling operation will depend on the number of chickens being processed as well as the possibility of using ice water to accelerate the cooling process.

- After chilling the birds should be “hung up to dry” by means of their wings if there are no trays or other devices for them to drain. It is important to ensure all water is removed from the carcase before further processing. This should not take longer than 10 minutes.

**Carcass packaging/cutting**

- The carcase temperature should be at +4 oC before packaging or cutting up into “joints”. This also makes packaging or cutting-up much easier as the carcase will have become rather stiff.

- A simple “packing cone” should be used to help pack a bird into a plastic bag – as little air should be left in the bag as possible. The use of a vacuum pump to draw vacuum can help in this operation.

- If carcase cutting is to be started, it is recommended to commence with the quartering of carcases at this stage of development. This can be done manually, but the use of a simple butcher's “band-saw” (available in
Senegal) is recommended. The development into further cuts can be foreseen at a later stage in the business development.

- The final packaging will depend on the client but a small polystyrene tray with a shrink film cover is the standard packaging in many parts of the world. One can use plastic bags for all cut products but presentation is not as good as in a tray. A label giving the weight and price should be attached. To save expense, a pre-printed label 900gr, 1.0 kg, 1.1kg etc can be used. This is more difficult with portioned cuts. End product should preferably be placed in carton boxes if available.

**Product storage**

- It is essential that the packed finished product be kept at + 4 oC in a storage chiller or sent straight to the client in chilled transport.

- It is recommended to also have a deep freezing storage at the processing facility - 25 oC. This is important to be able to buffer fluctuating demands and should production of such a facility create a surplus stock, this stock should then be frozen and sold as frozen product at a suitable time. Product that has not reached + 4 oC should not be frozen and frozen chickens should not be kept more that 6 – 8 months maximum in cold store (there is a distinct quality deterioration – drying out of the meat - after this length of time)

- There may have to be a space for the a veterinary inspector

The space requirement for such an operation is dependant on the capacity that is being installed. A building with approx. 200m2 should be sufficient to house this type of operation excluding the chilling and deep freeze installations which will depend on the availability in Senegal. It is recommended initially to obtain “movable/transportable” chilling / cold store space. This is to avoid expenditure that can not be recuperated at a later stage or development. If the sales of such a development start to outstrip the capacity of a “tuerie modern” then the next stage in development will normally be in the form of a semi-automatic line which MAY have to be installed in new or different premises. Therefore it is prudent not to install immovable chillers when they will still be required at a later stage.

The price of the above is dependant on many items but the basic machinery from EU can cost approx. 15,000 Euro = 9,800,000 cfa. without transport etc. This is dependant on capacity. Some machinery available have a capacity of 250 / 300 b.p.hr. Other costs depend very much on local availability and consequent prices.
Excluding buildings and chilling/cold stores, an investment level excluding local equipment for a capacity of 250 bph is approximately estimated to be between 15,000,000 and 20,000,000 cfa. This is regarded as a maximum.

5.1.5 Semi-automatic slaughtering lines
(see Floppy “Automatic line” + “Poulet”)

A semi-automatic, low capacity slaughter line has a capacity of approx. 500 birds per hour. This is regarded as the lowest capacity for which a line can be built and manufacturers normally do not offer smaller capacities. In a semi-automatic line the chickens are automatically transported on a chain through the different process stages as described above. The manual operations are carried out on the chickens as they are being transported – these are normally the killing operation, evisceration and removal of the hearts, liver and gizzard. Gizzard cleaning etc is performed away from the line.

Depending on the specification, a 500 b.p.h line can operate with approx. 10 - 13 people and a line running at 1000 b.p.h will need approx. 30 people.

An “automatic line” is a line with a minimum number of manual operations.

The packaging and eventual cutting up operation of the carcasses is the same in both options scenarios – i.e. whole carcasses and/or 4 chicken quarters.

Providing a semi – automatic line is well managed and run according to the manufacturer’s instructions, it has the advantages of better carcase handling, correct temperature control and much improved hygienic processing. It eliminates the “heavy” work involved in the early stages of processing and will normally produce a higher quality end-product.

5.1.6 Space requirement for a semi-automatic line

The size of building to house such a line is recommended to be as follows:-

Area 1: Bird reception - minimum c. 40 m2 (16%)
Area 2: De-feathering - minimum c. 65 m2 (26%)
Area 3: Evisceration - minimum c. 65 m2 (26%)
Area 4: Pre-cooling/Packaging - minimum c. 80 m2 (32%)
Total area = c. 250 m² (100%)

Area 5: Storage / Despatch = variable depending on stock policy and what type of chilling/deepfreeze installations are available.

It is therefore recommended that available production space should be at a minimum 250m². Space will also be needed for machinery, workshop, employees changing rooms etc. Another 20% could be added to this giving a total requirement of approx. 300m².

The minimum space requirement for a semi-automatic line at 500 birds per hour should be in the region of 300 m².

These areas are indicative recommendations. The actual sizes of building will depend on what can be found as acceptable in the circumstances in Senegal.

5.1.7 Capacity variations and their significance

The poultry processing industry is volume based - i.e. - there are economies of scale with high volumes. Chicken slaughter lines vary in capacities according to the requirements of the client. The lowest volume lines on the market start with a capacity of c. 500 birds per hour. (Large scale operations have line capacities exceeding 9000 birds per hour – 2.5 birds a second !!)

It is recommended that if a small scale capacity line is being considered, then a line of c. 500 birds per hour should be considered. Most of the lines produced today are so constructed that there is the possibility to increase capacity at a later stage. They are produced in a modular way that certain bottle necks can be upgraded.

A line of 500 birds / hour can produce the following outputs:

- Hours worked per day = 6
- Days worked per week = 5

500 x 6 x 5 = 15,000 birds per week x 50 weeks a year = 750,000 birds

This is assuming a machine efficiency (ME) of 100% which is not attainable. A machine efficiency (ME) of 70% is more realistic.

Therefore the output of such a line is as follows:

500 x 70%ME x 6 hrs x 5 days x 50 weeks = 525,000 birds p.a.
NB. 50 weeks are taken as realistic as plant maintenance etc. will have to be carried out during the year.

The **capacity can be increased** in two ways :-

1. **Longer running times** – i.e. 8 hrs a day and 6 days a week

   This will increase the output as follows :
   
   \[ 500 \times 70\% \text{ME} \times 8\text{hrs} \times 6\text{days} \times 50 \text{ weeks} = 840,000 \text{ birds per year} \]

2. **Increase the machine efficiency - ME** - i.e. 85% instead of 70%

   This will increase the output as follows:
   
   \[ 500 \times 85\% \times 8\text{hrs} \times 6\text{days} \times 50 \text{ weeks} = 1,020,000 \text{ birds per year} \]

The above variations show that there are many variables involved in calculating the outputs of a chicken slaughter line. Machine efficiency is very important for outputs and costs!!.

Experience has shown that as a first step, a realistic estimate of the possible outputs that should be taken into account. It is therefore recommended that the outputs calculated from such a line in the first years of operation will lie in the region of:

\[ 500 \times 70\% \text{ ME} \times 6\text{hrs} \times 5\text{days} \times 50 \text{ weeks} = 525,000 \text{ birds p.a.} \]

\[ 525,000 \text{ birds per year} = 10,500 \text{ birds per week.} \]

\[ (525,000 \times 1.4 \text{ kg} = 735,000 \text{ kg}) \]

As stated earlier in the importance of the Dakar region, the volume of chickens sold p.a. is approx. 6,225,000 kg. This means that if such a slaughtering volume can be achieved in the market place then this would mean a **local market share of c. 11.8 %!!**
5.1.8 Investment requirements

The major elements in such an investment excluding building purchase are as follows:

i) semi-automatic line at 500 bph

ii) transportation

iii) Import duties + insurance

iv) building adaptations + painting etc

v) installation costs

vi) reserve power generator

vii) hot water generator

viii) electrical power connections

ix) chillers and deep freezers

x) transport of chickens to slaughter house

xi) portion cutter

xii) tools and small packaging equipment

xiii) offices / personnel rooms etc

xiv) spare parts

On recent experience, a new line for 500 b.p.h. ex- Slovenia costs approx. 85,000 € without cooling equipment or transport. A total new line installed in Kosovo, for example, costs approximately 200,000 €- depending the availability of local materials and machinery.

Therefore if second hand equipment can be found for Senegal at, say 50% of the new purchase value, and local equipment such as chillers and deep freezers can be purchased relatively cheaply, then an investment of approximately 135,000 € - 150,000 € = 88.0 - 95.0 million cfa - is a possibility.
It must be stressed however, that this estimate is based on experience in Europe and that the possibility of obtaining local equipment has not been deeply investigated.

Offers from machine suppliers (both new and second hand) and local machine suppliers/importers will have to be gathered in order to obtain a more concrete investment base.

5.2 Development of Distribution channels & sales outlets

It has been identified that there is a demand for higher quality products on the one hand, and that there is a growing demand for smaller, individual portions of the chicken on the other. The growing popularity of the imported legs/thighs has strengthened this argument.

5.2.1 Recommendations

5.2.1.1 Development of distribution channels

As mentioned in the present situation in the poultry industry, there are no organised distribution channels for products or the commercialisation of chicken sales. The producers have no contact with the distribution and even less with the end user. They have no information on distribution patterns, volumes involved and changing consumer demands.

It is therefore recommended to support the ideas of FAFA and to develop the following ideas.

5.2.1.2 Distribution/development of the “New Markets”

The majority of chicken sales take place via the Bana Bana. It is estimated in this report that as much as 85% - 90% of poultry sales are via this channel. The whole “new” areas of trade such as the hotel industry, the emerging supermarket chains, the hospitals, army, airline catering, and the expanding tourist / restaurant industry, football club catering, etc, etc, are areas which have to be investigated, approached and developed. This is a business opportunity that needs to be explored.

5.2.1.3 Distribution to own outlet(s)

In parallel with the development to the “new” markets, this report supports the FAFA ideas to open one (or two) “own shops” in or around traditional Bana Bana locations.
This activity has many things to recommend it:

- information available on market prices and developments
- the opportunity to demonstrate to the buying public that there are better quality, Senegalese chicken products available
- that poultry can be purchased in better, more hygienic circumstances and with better packaging.

It is recommended to apply the following elements when starting this activity:

- The outlet(s) should be small, clean, bright, well lit,
- Should contain a chilled cabinet, a small fridge
- Should contain elementary hand washing/drying facilities.
- It should give the impression of “cleanliness and freshness” thus mirroring the product’s quality image!!
- Sales person to be clean and wear correct clean working apron/coat
- **Must be kept in this way !!!**

It outlet should not be large, approx 4 m x 4m – this should be enough space for such an operation. The premises should be able to be securely locked-up when not in use. There should be 1 sales person per shop and who would be responsible for the “shop”.

**5.2.2 Organisation and management**

In order to be able correctly organise this major change in operations as well as the mental agility that will be required by most of the members of FAFA, it is recommended to set up a “Wholesale / Sales / Marketing Organisation” (WSMO).

This can involve the engagement of an **experienced person** with knowledge of wholesale activities, preferably in the food industry

or:

develop a commercial contract with an **already existing company or organisation** who is willing to enter into a commercial agreement with the “Producers Group”.
The major tasks for this function/organisation would be as follows:

5.2.2.1 “New Markets”

• Prospect ALL possible outlets/clients
• Define outlets and consumer demands – which products, which quantities, fresh/ frozen, prices etc.
• Agree selling prices with Senior management of “Producer Group”
• Set up a sales ordering system/procedure
• Negotiate commercial terms per client
• Set up sales van routes in agreement with the clients
• Select and recruit personnel
• Establish ‘home base’ office and communications
• Responsible for whole operation

5.2.2.2 “Own Shop(s)”

• Find location for 1st shop(s)
• Agree rent etc
• Purchase chilled sales van max 5 ton
• Arrange purchase and installation of equipment and painting etc
• Select and recruit sales person and agree terms
• Set up co-responding sales van delivery pattern together with “New Markets”
• Agree sales prices with Senior Management of “Producer Group”
• Establish ‘home base’ office and communications together with “New Markets”
• Responsible for whole operation

5.3 The Business Plan

5.3.1 The need for a Business Plan

It is obvious that the eventual investment in a chicken slaughtering facility will not
be taken lightly. Even in wealthier economies an investment of this nature is a
serious business decision.

It has been strongly recommended that the “Producer Group” produce a well
constructed “Business Plan” (the Dyna Enterprise may be able to support in this)
which covers the complete industrial scenario – from broiler production/animal feed prices, slaughtering, to the production and sale of chickens and possible added value poultry products (e.g. cuts).

Paragraph 5.3.2 outlines the major topics which should be covered in such a “Business Plan”.

Slaughtering of animals in most parts of the world is not a large profit maker. In many parts of Europe for example, municipal slaughterhouse (mainly cattle and pigs) are common as private investment is not attracted to the slaughtering activity as such, and the municipality offer the facilities as a “service” to the community.

Poultry slaughtering is slightly different as the investment level is not as high compared as the capital requirement in cattle/pig slaughtering. However, private investors in slaughtering are nearly always the commercial players who also retail the chickens and value added poultry products onto the market.

The “Producer Groups” should take note of this and the commercialisation of the sales of chicken is of more importance than the investment in a slaughtering facility.

5.3.2 Contents of a “Business Plan”

In most commercial and financial environments, it normal business practice when applying to a bank or other financial institution for a loan or even a grant, the institution in question will normally request a “Business Plan”.

A “Business Plan” is normally a document which explains in clear terms the reasoning why the financial institution should offer a loan or grant. The actual data required by a bank, for example, may vary depending on the institution and their specific requirements, but here follows a typical content requirement for such a loan. Depending on the lending institution, the amount of funds required as well as the purpose of the loan, a loan period may run from 3 up to 15 years.

Example of the contents of a typical “Business Plan”

“Business Plan for Company /or Organisation “X”.

1. The Company or Organisation – background etc.
2. The organisation, key people, and their responsibilities
3. Background situation of the industry
4. Present situation in the industry
5. The market to-day and expected trends and developments
6. Purpose of loan – how much / for what/
7. Own capital availability
8. Planned capacity and expansion possibilities
9. Raw material input
10. Products to be produced
11. Sales volumes (years 1,2,3 etc), strategy and organisation
12. Competition
13. Quality and food safety issues
14. Financial analysis - Cash Flow calculations / pay back periods / profitability
15. Risks involved
16. Any other important issues

5.4 Organisation of FAFA and “Producer Group”

FAFA

It is clear that there is a need for change in the poultry industry and in their requesting support from the Dyna Organisation, it is apparent that they also need assistance in being able to cope with these changes.

The complete chain of activities in the poultry processing industry have been covered in this report:

- Poultry producers
- Slaughtering possibilities
- Products and presentation
- Wholesaling / Distribution – “New markets” and “Own Shops”

This chain covers a large area of economic activity. The report supports the formation of “Producer Groups” – A like minded group of “producers”, in this case poultry producers, who wish to commercially improve and sustain their situation.

This report believes that these changes will take place under a commercial umbrella. FAFA is an Professional Association which has been formed to represent the membership at certain levels and also provide certain services, information, and training etc. as requested by the members.

The organisation of a “Producers Group” has a commercial objective and therefore the organisation of this group should take place outside the FAFA’s sphere of activity.

It is strongly recommended that FAFA supports the creation of such a grouping and that FAFA in turn seek support in the setting up of such a “Producers Group” in Senegal. The Dyna Organisation has wide experience and contacts within
business in Senegal and should be able to give support to such an important development. It is also recommended to exchange experiences with other industries in Senegal where such groups or associations have or are being formed. Experience should also be sought from international poultry groups such as the EU's a.v.e.c. based in Copenhagen, Denmark. – "Association des Centres d'abattage de Volailles et du Commerce d' Importation et d' Exportation de Volailles" (addresses etc. see annex v)

OTHERS

It must also be stated that the investments and changes that are recommended in this report are not just limited to a “Producer Group”. If there are persons in or outside the industry that feel that they can see an opportunity in this sector, then there is no reason why they should not pursue these opportunities on a private or small group basis. However it is strongly recommended that the points made in this report are studied carefully.

5.5 Training requirements

It is strongly recommended that personnel training should be undertaken by FAFA / "Producers Group" in the skills required to successfully carry out poultry slaughtering. Training should not only cover slaughtering skills, but also the basics in hygienic food production, plant cleaning, and the importance of food safety. Machinery maintenance will also have to be addressed.

It is recommended in the first instance to train trainers – a small group of key people who can then train local personnel.

A recommended manner in which to get key personnel trained would be via the Poultry Processors Association (A.V.E.C) in the EU or else where. A training programme in a slaughtering facility in France, for example, could be arranged and funding of such training may be forthcoming from the French Association, a donor organisation, or even the Senegalese government.

It is recommended that as many possibilities be explored as possible as good training will bear rewards.
5.6. **Summary of recommendations**

It should be obvious that all recommendations made in this report are all interlinked –

- it is no good investing in a processing facility if there is no organisation to sell the products.
- setting up of distribution channels and the development of new sales outlets has little value if the same old quality and fluctuating supply have not been improved or co-ordinated.
- if there is not an organised supply of chickens, how can a new facility operate efficiently?
- what is the point of a new slaughtering facility if there are not the trained people there to operate it.
- same old cost of chickens will not help final sales volumes or margins
- etc

These are a few examples of the points that are all interlinked.

The formation of a “Producer Group” is the body which should co-ordinate all these activities. The major points and recommendations in each activity have been discussed at length in this report.

A “Producer Group” has to be a commercial operation and has to be professionally managed. Only when there is someone is clearly RESPONSIBLE for the all the operations can the improvements and developments become successful.

The major individual recommendations are as follows, but they must all be seen as interlinked activities:

1. **Lower** cost of chickens through better food purchasing

2. **Improvement of Quality**
   - Investigate investment in “tuerie modern”
     - or
     - semi-automatic slaughter line
   - Be prudent about too ambitious plans – “step by step”
   - Remember basic rules about building requirements
   - Get written permission first
   - Location – “near the chickens”
   - Don’t build – rent or hire to start
- Buy good second hand equipment if available
- Portable chillers and deep freeze can relocated
- Hygiene – important in this industry!
- Training requirements – Quality, hygiene etc
- Integrate into logistics / operational planning system with wholesaler organisation and poultry farmers

3. Organise distribution system

- Use a present food-wholesaler if available
- If not, recruit own with experience in food wholesale business
- Explore “New markets’
- Set up “Own Shop” - good but simple
- Choose good location and personnel
- Set up logistic / operations planning system in conjunction with slaughtering /supply operations

4. Creation of a “Producer Groups”

With the help of FAFA and the Dyna Organisation reorganise members into a “Producer Group” – the “Producers Group” will have to be professionally managed and be the organisation that co-ordinates all the major elements from chicken supply to sales volumes.

It is recommended that with any investment and new technologies, the “Producers Group” should adopt a very prudent policy with regard to investment choice and possible options. It is strongly recommended that at in first stages of investment, the “Producer Group” should avoid heavy financial commitment with regard to machinery when manual operations can easily be used instead.

Recommended investment:

The investment in a semi-automatic line will probably give the best quality product and also provide a “large” capacity to cover increasing sales volumes. The investment however is large for such a country as Senegal – c 80,0 million – 100,0 million cfa. – but because the industry is volume based, once a sales volume/client base has been established, this sort of facility is required to match the expected growth in sales.
However, as there is virtually no experience in the commercialisation of quality poultry products in Senegal the establishment of new “tuerie modern” facility (s) is recommended as the first basic step to improvement.

Finally two fundamental business elements always to be remembered:

- Quality is ALWAYS important, even in low purchasing-power economies

- Remember that “The customer is King!” – only by selling your products will your business have a chance to flourish!!
6. Annexes

i) Feed Price comparison Senegal v EU

<table>
<thead>
<tr>
<th></th>
<th>Belgium €/kg</th>
<th>Senegal Cfa / kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 to 7 % protein</td>
<td>0.300</td>
<td>Demarrage 213</td>
</tr>
<tr>
<td>Day 7 to 18/19 22% protein</td>
<td>0.320</td>
<td>Finition 219</td>
</tr>
<tr>
<td>Day 19 to 35 20,5% protein</td>
<td>0.279</td>
<td></td>
</tr>
<tr>
<td>Day 35 to 42 20% protein</td>
<td>0.276</td>
<td></td>
</tr>
<tr>
<td>Average = 21.2%</td>
<td>0.300 €</td>
<td>216,7 cfa/kg</td>
</tr>
<tr>
<td></td>
<td>196 cfa/kg</td>
<td>= c. + 110%</td>
</tr>
</tbody>
</table>

ii) Poultry slaughtering yields and cuts – (see Floppy “cut 1” and “cut 2” )
iii) Retail prices in Dakar Oct 2002

<table>
<thead>
<tr>
<th>Poulet Frais</th>
<th>“Score supermarché”</th>
<th>“Hyperscore’ supermarché”</th>
<th>Superette</th>
<th>Medina Dakar</th>
<th>Marche Bana Bana</th>
<th>Boucherie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poulet “Le Fermier”</td>
<td>2450</td>
<td>2450</td>
<td>2650</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poulet “Chair”</td>
<td></td>
<td></td>
<td></td>
<td>1700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escolope</td>
<td>6750</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coq</td>
<td>2950</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Poulet de pays”</td>
<td>2565</td>
<td>2565</td>
<td>2850</td>
<td>2200 par poulet</td>
<td>3600</td>
<td></td>
</tr>
<tr>
<td>Cuisse+Dos</td>
<td>1790</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ailerons</td>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poulet Vivant</td>
<td></td>
<td>1800 par poulet</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poulet Congelée</th>
<th>“Score supermarché”</th>
<th>“Hyper score’ supermarché”</th>
<th>Superette</th>
<th>Medina Dakar</th>
<th>Marche Bana Bana</th>
<th>Boucherie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poulet “Le Fermier”</td>
<td></td>
<td></td>
<td></td>
<td>2007 Brazil</td>
<td>1700</td>
<td>1700</td>
</tr>
<tr>
<td>Poulet “Chair”</td>
<td></td>
<td></td>
<td></td>
<td>2007 Brazil</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>Escolope</td>
<td>7500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coq</td>
<td>7500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Poulet de pays”</td>
<td></td>
<td></td>
<td></td>
<td>1684</td>
<td>1300</td>
<td>1300</td>
</tr>
<tr>
<td>Cuisse+Dos</td>
<td></td>
<td></td>
<td></td>
<td>1684</td>
<td>1300</td>
<td>1300</td>
</tr>
<tr>
<td>Ailerons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1300</td>
<td>1300</td>
</tr>
<tr>
<td>Poulet Vivant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
iv)  **Financial data ex- Kosovo April 2002**  
Automatic line 500 b.p.h. - New Investment

Entreprise « X « Kosovo, Avril 2002

### a) Structure des prix des ventes

<table>
<thead>
<tr>
<th></th>
<th>€</th>
<th>cfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Prix de poulet chair vive</td>
<td>1.608</td>
<td>1,054.78</td>
</tr>
<tr>
<td>2 Prix de poulet mort / kg</td>
<td>1.267</td>
<td>831.10</td>
</tr>
<tr>
<td>3 Frais d’abattage + vente /kg</td>
<td>0.282</td>
<td>184.98</td>
</tr>
<tr>
<td>4 Frais totale / kg</td>
<td>1.549</td>
<td>1,016.08</td>
</tr>
<tr>
<td>5 8 % marge par kg</td>
<td>0.124</td>
<td>81.34</td>
</tr>
<tr>
<td>6 Prix vente / kg</td>
<td>1.673</td>
<td>1,097.42</td>
</tr>
<tr>
<td>7 5% marge grossiste</td>
<td>0.084</td>
<td>55.10</td>
</tr>
<tr>
<td>8 12.5% marge vente direct</td>
<td>0.220</td>
<td>144.31</td>
</tr>
<tr>
<td>9 TVA 15%</td>
<td>0.296</td>
<td>194.16</td>
</tr>
<tr>
<td>10 Prix au consument</td>
<td>2.273</td>
<td>1,491.00</td>
</tr>
</tbody>
</table>

### b) Les volumes de vente

<table>
<thead>
<tr>
<th></th>
<th>Année 1</th>
<th>Année 2</th>
<th>Année 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vente par année kg</td>
<td>251,100 kg</td>
<td>631,000 kg</td>
<td>888,000 kg</td>
</tr>
<tr>
<td>Poulet par année a 1.8kg / poulet</td>
<td>197,872</td>
<td>497,242</td>
<td>693,459</td>
</tr>
<tr>
<td>Moyen poulet par semaine</td>
<td>3,835</td>
<td>9,636</td>
<td>13,439</td>
</tr>
<tr>
<td>Moyen utilisation par semaine</td>
<td>9.0 hrs</td>
<td>23.0 hrs</td>
<td>31.6 hrs</td>
</tr>
<tr>
<td>Moyen utilisation linge % p.a. %</td>
<td>22.6%</td>
<td>56.7%</td>
<td>79.1%</td>
</tr>
</tbody>
</table>
c) **Le “Cash Flow” / Liquide - Crédit – «Pay Back Period »**
Semi-automatique ligne – 500 p.p.h

i) Crédit = € 216,906 = 142,281,000 cfa pour 3 année

ii) Cash Flow / Liquide

<table>
<thead>
<tr>
<th>Année</th>
<th>€</th>
<th>cfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Année 1</td>
<td>-6,117</td>
<td>-4,012,489 cfa</td>
</tr>
<tr>
<td>Année 2</td>
<td>+231,166</td>
<td>+151,634,965 cfa</td>
</tr>
<tr>
<td>Année 3</td>
<td>+615,523</td>
<td>+403,756,621 cfa</td>
</tr>
</tbody>
</table>

iii) Crédit “Pay Back”

<table>
<thead>
<tr>
<th>Année</th>
<th>€</th>
<th>cfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Année 1</td>
<td>47,650</td>
<td>31,256,351 cfa</td>
</tr>
<tr>
<td>Année 2</td>
<td>83,988</td>
<td>55,092,516 cfa</td>
</tr>
<tr>
<td>Année 3</td>
<td>120,326</td>
<td>78,928,682 cfa</td>
</tr>
</tbody>
</table>

d) **Les Frais**

1 € = 655.957 cfa

**ANNEE 1**

<table>
<thead>
<tr>
<th></th>
<th>Total cost per month in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Labour Manoeuvre</td>
<td>2,070 35.1%</td>
</tr>
<tr>
<td>2 Electricity Electricite</td>
<td>804 13.6%</td>
</tr>
<tr>
<td>3 Water L'eau</td>
<td>150 2.5%</td>
</tr>
<tr>
<td>4 Office supplies Bureaux</td>
<td>3 0.1%</td>
</tr>
<tr>
<td>5 Telephone Telephone</td>
<td>35 0.6%</td>
</tr>
<tr>
<td>6 Packaging Emballage</td>
<td>1034 17.5%</td>
</tr>
<tr>
<td>7 Transport ( bird collection)</td>
<td>350 5.9%</td>
</tr>
<tr>
<td>8 Maintenance Mécanicien</td>
<td>50 0.8%</td>
</tr>
<tr>
<td>9 Canteen Restauration</td>
<td>620 10.5%</td>
</tr>
<tr>
<td>10 Waste disposal « déchets »</td>
<td>285 4.8%</td>
</tr>
<tr>
<td>Sub total</td>
<td>€ 5,401 91.6%</td>
</tr>
<tr>
<td>11 Sales Personnel Personnel</td>
<td>220 3.7%</td>
</tr>
<tr>
<td>12 Fuel for sales van Gasoil</td>
<td>150 2.5%</td>
</tr>
<tr>
<td>13 Advertising Réclame</td>
<td>128 2.2%</td>
</tr>
<tr>
<td>Sub total</td>
<td>€ 498 8.4%</td>
</tr>
<tr>
<td>Grand total</td>
<td>€ 5,899 100.0%</td>
</tr>
</tbody>
</table>
Total average costs per month = € 5,899
Moyen frais par mois
Average throughput per month in year no.1 = 20,900 kg
Moyen volume par mois en année 1
Therefore slaughtering / sales costs = €5,899 / 20,900 = € 0.282 /kg
Frais d’abattage / vente = € 0.282 / kg = 185 cfa / kg

Les frais – Année 2

<table>
<thead>
<tr>
<th></th>
<th>Total cost per month in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Labour</td>
<td>Manœuvre</td>
</tr>
<tr>
<td>2  Electricity</td>
<td>Electricte</td>
</tr>
<tr>
<td>3  Water</td>
<td>L’eau</td>
</tr>
<tr>
<td>4  Office supplies</td>
<td>Bureaux</td>
</tr>
<tr>
<td>5  Telephone</td>
<td>Telephon</td>
</tr>
<tr>
<td>6  Packaging</td>
<td>Emballage</td>
</tr>
<tr>
<td>8  Transport</td>
<td>Transport</td>
</tr>
<tr>
<td>9  Maintenance</td>
<td>Mécanicien</td>
</tr>
<tr>
<td>10 Canteen</td>
<td>Restauration</td>
</tr>
<tr>
<td>11 Waste dispos</td>
<td>« déchets »</td>
</tr>
<tr>
<td>Sub total</td>
<td></td>
</tr>
<tr>
<td>12 Sales Personnel</td>
<td>Personnel de vente</td>
</tr>
<tr>
<td>13 Fuel for sales van</td>
<td>Gasoil</td>
</tr>
<tr>
<td>14 Advertising</td>
<td>Réclame</td>
</tr>
<tr>
<td>Sub total</td>
<td></td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td></td>
</tr>
</tbody>
</table>

Total average costs per month = € 10,193
Moyen frais par mois

Average throughput per month in year no.2 = 52,600 kg
Moyen volume par mois en année nr.2

Therefore slaughtering / sales costs = €10,193 / 52,600 = € 0.1937 /kg
Frais d’abattage / vente = € 0.1937 / kg = 127 cfa / kg

Les Frais – Année 3

<table>
<thead>
<tr>
<th></th>
<th>Total cost per month in €</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Labour</td>
<td>Manœuvre</td>
</tr>
<tr>
<td>2  Electricity</td>
<td>Electricte</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>Water</td>
</tr>
<tr>
<td>4</td>
<td>Office supplies</td>
</tr>
<tr>
<td>5</td>
<td>Telephone</td>
</tr>
<tr>
<td>6</td>
<td>Packaging</td>
</tr>
<tr>
<td>7</td>
<td>Transport (bird collection)</td>
</tr>
<tr>
<td>8</td>
<td>Maintenance</td>
</tr>
<tr>
<td>9</td>
<td>Canteen</td>
</tr>
<tr>
<td>10</td>
<td>Waste disposal</td>
</tr>
<tr>
<td></td>
<td>Sub total</td>
</tr>
<tr>
<td>11</td>
<td>Sales Personnel</td>
</tr>
<tr>
<td>12</td>
<td>Fuel</td>
</tr>
<tr>
<td>13</td>
<td>Advertising</td>
</tr>
<tr>
<td></td>
<td>Sub total</td>
</tr>
<tr>
<td></td>
<td>Grand total</td>
</tr>
</tbody>
</table>

Total average costs per month = € 12,864
Moyen frais par mois

Average throughput per month in year no.3 = 74,000 kg
Moyen volume par mois en année nr3

Slaughtering / sales costs = € 12,864 / 74,000 = € 0.1738 / kg
Frais d'abattage / vente = 114 cfa / kg

v) Addresses of European Professional Poultry Associations

1. “a.v.e.c” - “Association of Poultry Processors and Poultry Import and Export Trade” of the EU based in Denmark.
   - “Association des Centres d’abattage de Volailles et du Commerce d ‘Importation et d’Exportation de Volailles”

   Contact person : Secretary general Mr. T. LYSGAARD

   web site : www.avec.dk

2. French organisation (within a.v.e.c.) :

   FIA , 184, rue de Vaugirard, 75015 Paris, France
President :                F. Ranc
Delegue general :      Andre Lepeule
                      Tel:  00 31 1 53 58 48 10
                      Fax:  00 31 1 53 58 48 19
                      e-mail: F.I.A@wanadoo.fr

3.   Italian organisation (within a.v.e.c.)

Unione Nazionale dell'Avicoltura, (UNA),
Via Vibio Mariano  58,  I- 00189 Roma, Italy.

Secretary General : R. Pasquarelli
                      Tel: 00 39 0633 25 841
                      00 39 0633 25 24 27
                      Fax 00 39 0633 26 20 13
                      e-mail : una@unionenazionaleavicoltura.it
                      web site : www.unionenazionaeavicoltura.it

vi)    Contacts of major machine suppliers

Large semi-automatic lines

1.  STORK  PMT B.V.
P.O.Box 118,
5830 AC Boxmeer ,
The Netherlands
                      Tel:  00 31 485 586111
                      Fax : 00 31 485 586 483
                      Web site : www.storkpmt.com
                      Contact : Mr. Janhenk HOEKMAN

2.  MEYN Food Processing Technology B.V.
Noordeinde 68,
1511 AE Oostzaan,  
The Netherlands  
Tel: 00 31 756 843 355  
Fax: 00 31 756 844 150  
Web site: www.meyn.nl  
Contact: Mr. Martin VONK

3. JM Poultry Technology BV  
PO Box 594,  
AN Purmerend 1440,  
The Netherlands  
Tel: 00 31 299 413 663  
Fax: 00 31 299 413 676  
Web site: www.jm-poultry.com

4. PIVKA Oprema d.o.s.  
Neverke 30,  
6256 Kosana, SLOVENIA  
tel: 00 386 573 0470  
fax: 00 386 573 0455  
Contact: Mr. Andrej FATUR

Small “tuerie modern” equipment

5. Patrini Impianti SRL,  
Via G. Amendola 4,  
24047 Treviglio (BG),  
Italia  
Tel: 00 39 0363 417 29  
Fax: 00 39 0363 44608  
e-mail – patrini@axia.it  
Contact: Mr. Patrini

Used machinery

6. Barsso NV,  
Wulfsbergstraat C2
8550 Zwevegem, Belgium
Tel: 00 32 56 77 33 50
Fax: 00 32 56 77 34 33
e-mail: info@barsso.com – (can use French)

7. Boyd Food Machinery, Rannas, Buckie, AB56 4BA, Scotland
Tel: 00 44 1542 835 885
Fax: 00 44 1542 835 080
e-mail: sales@boydfood.com

vii) Useful web sites for Poultry industry:

www.meatandpoultryonline.com

http://poultrynet.gatech.edu

www.meatingplace.com