

PORK PROCESSING IN GHANA

#1: THE STATE OF THE ART

#2: MATERIAL AND EQUIPMENT REQUIREMENT

#3: COST OF PRODUCTION ESTIMATES

BY

E.C-T. TETTEY

1991

PORK PROCESSING IN GHANA.

An overview of the state of the art, material and equipment requirements and cost of production estimates.

This script attempts to analyse the state of the art in meat processing in Ghana, with special emphasis on pork processing, including material and equipment requirements and the cost of production estimates.

It is hoped that the information provided will assist the prospective entrepreneur to get organised before investing and venturing into this industry.

A. MARKET AND PRODUCTION.

1. Key production personnel, their qualifications and requisite experience.

The key production personnel are generally of the technical level grade, some of them holding certificate or diploma in meat processing technology. Some have acquired their experience on the job in meat processing outfits abroad and others by working with expatriate production personnel locally. There are however only few well-qualified meat technologists and scientists (with post-graduate qualification), this group can mainly be found in the universities and research institutions.

2. Statistics available and where

Generally, there is no organised statistical data on processed meat production in Ghana. This is mainly due to the small or medium-scale level of production geared towards a very small consumer market. However, production data for the individual processing units may be obtained upon request. Statistics on livestock numbers and slaughter figures are also available from the Animal Production Division of the Ministry of Agriculture, Accra.

3. Main operators, their size and market control.

a. Meat Marketing Board.

Used to control about 30% of market supply with mainly fresh meat cuts. The Board also used to sell imported processed meat eg. salted trotters, salted beef, cow legs etc. Some of these goods were however imported by individuals.

At the moment, the Board's activities has almost grounded to a halt due to financial and other constraints. The most inevitable option for the Board seems to be privatization.

b. UTC, Multistores, Kingsway, Ramona, Kwatsons and other supermarkets in Accra and elsewhere.

These supermarkets undertake small meat processing activities and also import a variety of processed meat products. Together they contribute to about 40% of the processed meat supply on the market. Products marketed include various sausage types, bacon, ham, smoked meat products, fresh meat cuts, burgers, minced meat, salted meat types and various canned meat products, etc.

c. Gihoc Meat Products, Bolgatanga.

Large-scale operator in terms of equipment capacity, but due to lack of raw materials (mainly raw meat) and other constraints, the factory is at the moment producing only canned corned beef at a very low level. Supply to the market may probably be less than 5%. Part of the produce also has a small export market.

Currently the factory has been shut down and the workers are mainly on the doll.

d. Quality Meat Products Ltd.--- Tema.

The factory was originally established by some state owned organisations and some individual business men, but now on lease to interested entrepreneurs.

This factory is a large-scale operator for a variety of pork products, eg. fresh sausages, frankfurters, burgers, ham, bacon, salted pork, etc. Production depends mainly upon the availability of slaughter animals and standing orders obtained. Usually about 10 to 20 pigs per week may be processed. This factory also supplies small quantities of meat products to some of the operators in (b) above and elsewhere. When in active production tyhe can supply over 40% of the market demand for Accra and elsewhere.

Due to poor management and inadequate and sustained supply of raw materials, especially meat, the factory has changed ownership a couple of times over the past few years.

e. Kpong Farms Ltd.,— Akuse.

This is a subsidiary establishment of the VRA (Volta River Authority), which incorporates crop farms, especially rice production and processing, livestock farming, grain drying, feed milling and meat processing.

Due to the favourable investment by VRA in the meat processing sector, the factory at the moment is one of the leading meat processing outfits in Ghana in terms of quantity and the variety of products produced.

The range of processed meat products include the following:

frankfurters
burgers
pate`s
bacon and ham
fresh/frozen meat cuts
frozen edible offals etc.

The factory has a retail outlet in Accra on the premises of the Accra Polo Club, called the " Chukka Grill", where their products are decently and attractively displayed in refrigerated display cabinets for sale. The Chukka Grill also serves grilled and fried meat products with potato chips.

f. Other operators.

There are a host of small-scale operators in Accra and other regional capitals engaged in meat processing in the quite to meet specific customer demands. Their contribution to the total market supply of processed meat products is however generally very small.

The Animal Science Departments of the three universities in Ghana ie. UST, UCC, and UG, have small-scale meat processing units mainly used for teaching purposes. However, these units also embark on the processing and sale of various meat products to the university population and customers outside campus. The main meat products encountered include the following: fresh sausages, frankfurters, ham and bacon.

Other operators also abound throughout the country, but they are mainly fresh meat retailers. No formal meat processing occurs, though some of them potentially can undertake meat processing.

4. Factors affecting demand, supply and price of processed meat products.

The processed meat industry in Ghana can be described as rather on a small to medium-scale, and also limited to some few operators. The demand for the products is again in the main limited to some sort of class society. The supply of goods is therefore dictated by the demand made by this class.

However, with the upsurge of many "fast foods" industries in the major cities these days, trends are changing and many people of different social classes are readily demanding processed meat products. The potential for an increased demand for the goods is therefore envisaged.

The supply of goods will depend on the availability and cost of the major raw materials, eg. pork and beef. This will also be dictated by the total cost of animal production. With pigs, for example, the cost of production will depend upon the availability and cost of the major feedstuffs, eg. wheat bran, maize, fishmeal and also drugs etc. The production cost affect the overall production output and the unit cost of meat. The processing entrepreneur will therefore be faced with the changing cost of his raw material (meat), this will also affect the unit cost of his products and subsequently the demand for the products.

5. Effect of season or weather, raw materials and technology on the meat processing industry.

The effect of season or weather on the industry stems up from the effect of season or weather on the overall cost of animal production. This is manifested on the availability and cost of the feeding ingredients. When the ingredients are abundant, the farmer can finish off his animals for the market faster and at a minimal cost of production, other overheads being taken care for. The processing entrepreneur can therefore take advantage of the availability and cheaper unit cost of his major raw material (meat), to produce at a minimal cost. Once the supply of goods is increased at a cheaper unit cost, the demand is likely to be increased. This is not however, at the expense of a good quality product.

Technology affects the industry in as much as the eating quality and aesthetic appearance of the product adversely affects the prospective buyer. Except for price in some few instances, a prospective buyer is most likely to be attracted to a product hygienically prepared, attractively packaged and displayed under suitable temperature conditions.

The raw materials involved in meat processing can be divided into two groups: Group 1-- the materials here are for animal production and therefore indirectly involved in meat processing. These include feedstuffs, drugs, etc.

Group 2-- the materials here include those directly involved in meat processing ie. meat processing ingredients such as salt, sugar, preservatives, spices, cereal fillers, food colours, etc.

Group 1 materials are affected directly by the season, therefore their availability and quantity affect both animal production and meat processing.

Group 2 materials are all affected by the season, but its effect on the availability of meat is of most importance. The effect of the season on the other meat processing ingredients especially the spices is quite insignificant, and indeed they do not form major part of the processing cost of raw materials.

The development and expansion of the processed meat industry will depend directly on the development and expansion of the animal production industry which also depends directly on the availability and cost of the feedstuffs. The potential for increased pig production in the country clearly exists and will be enhanced by least-cost feed formulations and good husbandry and management practices. This is the basis for an increased supply of the needed raw material for the development of the processed meat market.

6. Cost of materials

The cost of materials will be divided into the following:

- a. cost of equipment and other accessory materials
- b. cost of meat and meat components
- c. cost of curing ingredients (pickle curing) per carcass
- d. cost of smoking per carcass
- e. cost of 100kg weight fresh pork sausage production with 65% meat content
- f. cost of 100kg weight beefburger production with 80% meat content.

a. Cost of equipment and other accessory materials

ITEM	QNT.	UNIT COST (cedes)	TOTAL COST (cedes)
1. standing freezer (medium size)	1	400,000.00	400,000.00
2. refrigerator (medium size)	1	300,000.00	300,000.00
3. cutting table	1	20,000.00	20,000.00
4. packaging table	1	20,000.00	20,000.00
5. smoke house	1	150,000.00	150,000.00
6. plastic containers with covers.(10-15 litre capacity)	4	8000.00	32,000.00
7. aluminium trays	2	3,500.00	7,000.00
8. syringe with barrel (stitch pump)	1	40,000.00	40,000.00
9. meat boning axe	1	15,000.00	15,000.00
10. butcher's knife set	1	25,000.00	25,000.00
11. weighing scale (10kg max.wt.)	1	20,000.00	20,000.00
12. weighing scale (ca.100kg max.wt.)	1	200,000.00	200,000.00
13. bowl cutter	1	2,500,000.00	2,500,000.00
14. sausage filler (with burger forming attachment)	1	2,000,000.00	2,000,000.00
15. vacuum sealer	1	3,500,000.00	3,500,000.00
16. packaging films (assorted)	1000	50.00	50,000.00
17. natural casings	100kg.	1000.00	100,000.00
18. artificial casings	50kg.	1000.00	50,000.00
19. meat slicer	1	2,000,000.00	2,000,000.00
SUB-TOTALS:			11,379,000.00

b. Cost of meat and meat ingredients.

Assuming an average liveweight of 91kg pig with a killing out percentage of 60, then the following carcass data will be obtained:

Component	Approx. wt. (kg)	Unit cost (cedes)	Total cost (cedes)
1. Dressed carcass	54.6	1,400.00 (bone-in)	76,440.00
2. Edible by-products	22.5	500.00	11,250.00
3. Inedible by-products	13.6	----	----
4. Losses	0.3	----	----
SUB-TOTALS:			87,690.00

NB: In reality, the various carcass components ie. 4 legs, 2 loins, 2 bellies, 2 shoulders, 2 hinds, etc. will attract different sale values, thus the real total sale value of meat components may be higher than quoted here.

c. Cost of curing ingredients(pickle curing) per carcass.

Ingredient	Total ingredients required/ carcass	Unit cost/kg (cedes)	Total cost (cedes)
1. Salt	1.6kg.	100.00	160.00
2. Sugar	400g	500.00	200.0
3. Sodium Nitrite	1.0g	10,000.00	10,000.00
4. Acetic Acid (glacial)	100ml.	35,000.00 (per 2.5 litres)	1,400.00
5. Water	20 litres	40.00/litres	800.00
SUB-TOTALS:			12,560.00

d. Cost of smoking per carcass.

Item	Quantity required	Unit cost (cedes)	Total cost (cedes)
1. Firewood	4 headloads	500.00	2,000.00
2. Sugarcane chaff	1 mini-bag	200.00	200.00
3. Twine	1 roll	500.00	500.00
SUB-TOTALS:			2,700.00

e. Cost of 100kg wt. fresh pork sausage (65% meat content).

Ingredient	Amount required (kg.)	Unit cost/kg. (cedes)	Total cost (cedes)
1. lean pork (boneless)	37.5	1,400.00	52,500.00
2. pork backfat	27.5	200.00	5,500.00
3. cereal rusk	11.25	1000.00	11,250.00
4. seasoning mix	2.5	1000.00	2,500.00
5. water (iced)	21.25	40.00/litre	850.00
SUB-TOTALS:			72,600.00

F. Cost of 100kg wt. beefburger (80% meat content).

Ingredient	Amount required (kg.)	Unit cost/kg. (cedes)	Total cost (cedes)
1. lean beef (boneless with 20% visible fat)	60.00	1760.00	105,600.00
2. beef fat	20.00	400.00	8000.00
3. cereal rusk	5.00	1000.00	5000.00
4. seasoning mix	2.50	1000.00	2,500.00
5. polyphosphate	500g.	8000.00	4,000.00
6. water (iced)	12.00	40.00/litre	480.00
		SUB-TOTALS:	<u>125,580.00</u>

7. Estimation of wastage.

With ham and bacon production, no wastage is envisaged except for losses due to dripping of tissue fluids from cut meat surfaces, fluid evaporation from cut meat surfaces and cutting losses. These losses could amount to about 2% of the carcass weight. Inedible by-products may amount to about 13% of the animal's live weight. This will comprise of the following: intestinal contents, hair, hoof, gall bladder, urinary bladder, etc. Almost all the visceral organs are edible and can be sold as such.

8. Product and quality control.

The quality of the product may well depend very much upon the following:

- i. Quality of the raw material
- ii. Handling and storage of the raw material
- iii. Process control and hygiene during processing
- iv. Handling, packaging and temperature control of end-products during storage and distribution.

NOTE:

- * A poor quality raw material will not produce a good quality product and the shelf life of the product will be shortened.
- * When temperature and time controls are abused during processing, the quality and shelf life of the product will accordingly be adversely affected.
- * After processing, temperature control during storage, effective packaging and good handling practices are necessary to avoid recontamination and extend the shelf life of a good quality product.
- * The product cannot however remain frozen for example, for ever while maintaining the same quality. Below is a table of expected shelf life of pork and some pork products in chilled and in frozen storage.

Product	Expected storage life
a. pork (fresh)	1 to 2 weeks at (-1C to 0C)
b. edible offals	7 days at (-do-)
c. fresh sausages and beefburgers	5 days at (-do-)
d. bacbn and ham	4 weeks at (-3C to -1C)
e. pork (fresh)	6 months at (-18C)
f. bacon (unsmoked)	2 to 4 months at (-18C)

9. Equipment and capacity.

I. BOWL CUTTER

- * Model No: CT 120
- * Capacity: 72kg (can handle between 1 to 1.5 carcasses at a time).
- * Push button control
- * One person to control
- * Range of products:
sausages, and burgers (all types).

* Distributing agent:

STALBERK FOOD MACHINERY
36 Hoskins Road
Oxted, Surrey RH8 9TD.

Telex: 361507 (quote Ref.7777).

II. SAUSAGE FILLER WITH BURGER-FORMING ATTACHMENT

- * Model No: ESG 55
- * Capacity: 50kg meat (handle about 1 carcass at a time)
- * Ability to attach burger forming unit
- * Two persons to operate
- * Range of products as in (I) above
- * Distributing agent as in (I) above

III. VACUUM SEALING MACHINE

- * Model No: VMT 19 WRIGHTVAC High-Vacuum Sealing Machine.
- * Dimensions: 450*490*200 mm.
- * All stainless steel construction for hygiene
- * One person to operate
- * Distribution agent:

Willis Europlant Ltd.,
Gravel Hill House,
Wombourne, Wolverhampton,
West Midlands,
WV5 9HA.

Tel: 0902-894430
Telex: 338485 Willis G.

IV. MEAT SLICER

Everyday Food Process Eng. Co.,
Unit 2, EPH Ind. Estate,
Faraday Road, Swindon,
Wiltshire.

Tel: (0793) 37551
Telex: 849462

V. BAND SAW

A.E.W. Engineering Co. Ltd.
Horizon Works
Dereham Road
Norwich, NR5 OSA.

Tel: 0603-745522

VI. HAND-HELD LABELLING AND CODING MACHINE
(For pricing, tag marking, bar coding etc.)

Nor Systems,
Harwich, Essex,

Tel: (0255) 503131
Telex: 98156

VII. SEASONING MIXES FOR ALL KINDS OF COMMINUTED MEAT PRODUCTS.

RHM INGREDIENT SUPPLIES LTD.
Torre Road, Leeds,
LS9 7RZ.

Tel: 0532 480040

VIII. PROCESSING EQUIPMENT LTD.
Manor Road, Marston Trading Estate,
Frome, Somerset, BA11 4BN.
Tel: (0373) 73301

*** FOR ALL MAKES, TYPES AND SIZES OF MEAT PROCESSING UNITS.

IX. SMOKE HOUSE

- * Will be locally constructed with separate smoke and heat generating components.
- * Capacity: 1.5 to 2 pig carcasses per smoking run.
- * 1 to 2 persons to operate.
- * Range of products: all kinds of meat cuts.

X. MINIMUM PRACTICABLE PRODUCTION SCALE

- i. Burger-type products: 200kg. per week.
- ii. Sausage-type products: 250kg. per week.
- iii. Bacon and Ham products: 5 carcasses per week.

NB: A small-scale production unit probably based in the house will entail processing about 1 to 2 carcasses per week initially, and up to 5 carcasses per week with experience and increased demand.