

# **AN APPRAISAL OF THE OPPORTUNITIES IN THE 'SKIN-ON SHEEP MEAT' MARKET FOR WALES**



Produced by MLCSL Consulting

**On behalf of Hybu Cig Cymru - Meat  
Promotion Wales (HCC)**

**For Food Standards Agency Wales**



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## SECTION 1: A BACKGROUND TO 'SKIN-ON GOAT/ SHEEP MEAT'

### 1.1. 'Skin-on sheep meat'

Smoked 'skin-on goat/ sheep meat' is also commonly referred to as 'smokies'. Both are terms used to describe:

*'Skin-on mutton or goat meat, where the skin has been dehaired and scorched (removing any remaining hair) giving the skin a light golden colour and the meat a woodsmoke flavour.'*

Smoky is a term used to describe something that has the taste or flavour of smoked food, e.g. smoky bacon. Smoking food is commonly undertaken as a means of preserving food (i.e. by hanging the food in the smoke of a fire). Whilst preservation may have been a traditional reason for the production of smoked 'skin-on goat meat' (due to the low numbers of goats in the UK, older ewes are used to produce 'skin-on sheep meat'), it is believed that the current (illegal) production of smoked 'skin-on sheep meat' in the UK is not for preservative reasons, but for taste reasons.

As a product smoked 'skin-on goat meat' is reputed to be one of the traditional foods for some sectors of the ethnic community particularly recent immigrants from Africa and parts of Asia. Within predominantly the inner city areas of the UK (and potentially in other parts of Europe) demand for smoked 'skin-on goat meat' is reputed to be significant. However, as the production of 'skin-on sheep meat' is illegal any supply is both limited and risky (i.e. UK producers and retailers of 'skin-on sheep meat' operate outside of the law) and does not satisfy the demand. Due to this currently it is alleged that smoked 'skin-on sheep meat' sells for high prices.

The meat from goats is believed to be the preferred option for customers of the product, but due to the shortage/ unavailability of supply of such in the UK, cull ewe meat/ mutton is an accepted alternative.

Within this report smokies/ smoked 'skin-on goat or sheep meat' is referred to as 'skin-on goat/ sheep meat'.

### 1.2. Legislation and 'skin-on sheep meat' production

The production of 'skin-on goat/ sheep meat' in the UK and Europe is not permitted according to European law. The legislation preventing the legal production of 'skin-on goat/ sheep meat' is detailed below. The legislation likely to be contravened as a result of the illegal production of 'skin-on goat/ sheep meat' in the UK is also given.

#### ***Food Hygiene and 'skin-on goat/ sheep meat'***

From the 1<sup>st</sup> January 2006 **Regulation (EC) 853/ 2004 laying down specific hygiene rules for food of animal origin** has been applied in the EU. This regulation is commonly referred to as the H2 regulation. Other food hygiene regulations also applied on this date:

- Regulation (EC) 852/ 2004 (H1) on the hygiene of foodstuffs; and
- Regulation (EC) 854/ 2004 (H3) laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption.

These regulations consolidated and simplified existing food hygiene regulations that were previously in force and which also did not permit the production of 'skin-on goat/ sheep meat'.

The legal requirement for the skin to be removed from sheep meat is stated within the **Regulation (EC) 853/ 2004** (H2). Below is an extract from this regulation that applies to this subject.

**Regulation (EC) 853/2004 (H2) laying down specific hygiene rules for food of animal origin**

This regulation states that: food business operators operating slaughterhouses in which domestic ungulates are slaughtered must ensure compliance with the following requirements.

7. Stunning, bleeding, skinning, evisceration and other dressing must be carried out without undue delay and in a manner that avoids contaminating the meat. In particular:

- (a) The trachea and oesophagus must remain intact during bleeding, except in the case of slaughter according to a religious custom;
- (b) During the removal of hides and fleece:
  - (i) Contact between the outside of the skin and the carcase must be prevented; and
  - (ii) Operators and equipment coming into contact with the outer surface of hides and fleece must not touch the meat;
- (c) Measures must be taken to prevent the spillage of digestive tract content during and after evisceration and to ensure that evisceration is completed as soon as possible after stunning; and
- (d) Removal of the udder must not result in contamination of the carcase with milk or colostrum.

**8. Complete skinning of the carcase and other parts of the body intended for human consumption must be carried out, except for porcine animals and the heads and feet of ovine and caprine animals and calves.** Heads and feet must be handled so as to avoid contamination of other meat.

9. When not skinned, porcine animals must have their bristles removed immediately. The risk of contamination of the meat with scalding water must be minimised. Only approved additives may be used for this operation. Porcine animals must be thoroughly rinsed afterwards with potable water.

The removal of the skin (flaying) enables the Official Veterinarian to inspect the carcase's fresh meat externally. Any lesions, abscesses and bruises are noticed during this stage. The fleece is recognised as being a potential source of contamination, and during flaying, the skin and the fleece are removed as one. A Food Standards Agency (FSA) research project has been undertaken by Bristol University to investigate if a hygienic procedure for the production of skin-on sheep meat can be practically developed.

This regulation is enforced by the following Statutory Instruments:

- England: The Food Hygiene (England) Regulations 2006;
- Wales: The Food Hygiene (Wales) Regulations 2006;
- Scotland: The Food Hygiene (Scotland) Regulations 2006; and
- Northern Ireland: The Food Hygiene Regulations (Northern Ireland) 2006.

### ***Other legislation and 'skin-on goat/ sheep meat'***

Aside from the production of 'skin-on sheep meat' being illegal due to the skin remaining on the carcase, the production also contravenes other aspects of the hygiene regulations as these may not be adhered to.

These include:

- The use of approved premises – approved to slaughter and process sheep;
- Ensuring animals are properly identifiable;
- That sheep are clean, healthy and of satisfactory welfare when slaughtered;
- The meeting of withdrawal periods of veterinary drugs before slaughter;
- The requirement for veterinary inspections:
  - Ante mortem and post mortem inspection of carcasses by official veterinarians;
  - The health marking of carcasses by official veterinarians;
  - The inspection of specified risk material and other animal by-products; and
- The hygienic storage and transport of meat products; and
- The removal and correct disposal of specified risk material and other animal by-products.

Additionally to aspects of the hygiene regulations not being met, it is possible that the following regulations are not met either:

- Humane slaughter - Welfare of Animals (Slaughter or Killing) Regulations 1995, deriving from Council Directive (EC) No 93/119;
- The Transmissible Spongiform Encephalopathies Regulations, deriving from EU Directive 999/2001; and
- Disposal - Animal By-products Regulations 2005, derived from Commission Regulation (EC) No 1774/2002 – the methods of disposal of Animal By-products that arise through the illegal production of 'skin-on sheep meat' are unknown. If disposed of incorrectly, it is possible that it could be damaging to environmental, animal and human health.

Additionally to the potential risk to public health of the current illegal production of 'skin-on goat/ sheep meat', is the potential risk to both human and animal health through the illegal importation of 'skin-on goat/ sheep meat'. Anecdotal evidence indicates that there is still significant illegal importation of meat products e.g. bush meat (and possibly also 'skin-on goat meat'), not by traders, but by individuals (the consumer/ their family). This defies the following regulations - The Products of Animal Origin (Third Country Imports) (England) Regulations 2006, transposed from Commission Regulation (EC) No 745/2004.

### **1.3. Enforcement**

Any current/ recent production of 'skin-on goat/ sheep meat' in the UK would have been done so in unapproved slaughterhouses, that operate outside of both the FSA and Meat Hygiene Service (MHS) remit. Therefore, it is the responsibility of the local authority Environmental Health Officers (EHO) to enforce the current regulations. The EHOs have powers to prosecute producers, suppliers and retailers of 'skin-on goat/ sheep meat'.

During this project, visits were made to the potential retailers of 'skin-on sheep meat', the butcher shops that largely serve parts of the ethnic community (particularly those of Asian, African and Afro Caribbean descent) in the London Street markets of the Elephant and Castle, Brixton and Dalston). Allegedly, a number of these butcher shops may have retailed 'skin-on sheep meat' before the enforcement of regulations became more stringent.

It was clear that vigilant enforcement has arisen since the increased awareness of 'skin-on goat/ sheep meat' production since 2003. The Southgate report (2005) was carried out at the time that the enforcement of regulations had become more rigorous and the EU food hygiene regulations (H1, H2 and H3) were introduced.

What 'skin-on goat/ sheep meat' trade there is today it would seem is more under the counter than it was a few years ago (allegedly 'skin-on sheep meat' carcasses used to be openly displayed on rails around butchers shops). When questioned, the butchers spoken to indicated that some butchers may currently sell 'skin-on sheep meat' to order. As expected, none of those interviewed admitted to selling the product today.

The report determined that the practice of the local authorities to now use staff of similar ethnic origins to those likely to purchase 'skin-on sheep meat' to check on such butchers shops has made it more difficult for butchers shops to 'bend the rules' (fines per offence in the London area are alleged to be as high as £10,000).

#### **1.4. Section summary**

'Skin-on sheep goat/ meat' or smokies are terms used to describe: *'Skin-on mutton or goat meat, where the skin has been de-haired and scorched (removing any remaining hair) giving the skin a light golden colour and the meat a wood smoke flavour'.*

Alleged current production (and illegal bush-meat importation) and sale of 'skin-on goat/ sheep meat' potentially have implications for:

- Animal health and welfare;
- The environment; and
- Human health.

Increased enforcement of 'skin-on goat/ sheep meat' production in the past 5/ 6 years has pushed illegal production further 'underground'.

Legalising the production of 'skin-on goat and sheep meat' would potentially enable existing approved abattoirs to legally produce the product, whilst meeting the requirements of all regulations outlined above.

## **SECTION 2: RECENT WORK**

### **2.1. Legal developments in approving the production of 'skin-on sheep meat'**

In order to amend the hygiene legislation to allow the legal production of 'skin-on sheep meat', the FSA must provide the European Commission (EC) with an evidence base that supports a change in legislation.

#### ***Possible ways the legislation may be adapted to permit the production of skin-on sheep meat***

- 1. From 1 January 2006 sheep are continued to be required to be produced skin-off, but skin-on feet of sheep, goats and cattle are allowed.**
- 2. Article 10 of H2 allows national measures to be introduced to enable production of traditional products. These have to be approved through a 'comitology' procedure:**
  - Notification of Commission and other Member States (MS);
  - Provision of detail; and
  - Provision of Hazard Analysis.

However, the production of skin on sheep may not be viewed in the EU as a traditional method of production, although a national measure can be introduced for this purpose.

If the Commission or another MS raised queries the issue would be referred to Standing Committee on Food Chain and Animal Health (SCOFAH). Approval may come about:

- a) By default if no comments are received within 3 months and the Commission does not take any further action within 1 month of that. This would then require National Legislation, which would depend on parliamentary time.
- b) By Commission Decision following discussion at SCOFAH.

Given the many factors involved however, it is difficult to make an estimate as to how long this procedure could take.

In order to provide the necessary underpinning hazard analysis to complete this process with some confidence of success, information is being gathered by FSA (see section 2.2. and 2.3.).

#### ***The process of smoking the carcass***

The process of producing 'skin-on goat/ sheep meat' is discussed in detail in Section 5.

If it were possible to produce 'skin-on goat/ sheep meat' legally then the process of producing 'skin-on sheep meat' from a sheep carcass would have some similar processes to the de-hairing process used during pig processing. Pig processing involves the following stages; scald – de-hair – singe – polish.

'Skin-on sheep meat' processing would not require a scalding process, but to de-hair the carcass, the fleece would need to be shorn to 5mm (this would probably need to be done before slaughter). This is regularly practiced in Australia, where guidelines from Meat and Livestock Australia (MLA) suggest that sheep for regular 'skin-off sheep meat' are shorn at least two weeks before slaughter to minimise stress (which impacts upon meat eating quality). This of course would have practical implications for the farmer.

In theory, during the singeing process, the skin protects the meat from being cooked. The singeing process is expected to not be long enough for the meat to begin cooking. An objective of the singeing process is to permanently alter the colour of the skin. Therefore the singeing process should not adversely affect the meat.

Following the singeing process, the charred remains of wool are required to be washed off. The skin is a waterproof surface, and contaminated water will not be able to penetrate the skin (unless the skin was cut at all during shearing/ slaughter).

## **2.2. Research carried out for the FSA**

### ***Hygienic production***

The FSA funded a research project with the University of Bristol to develop a process for the hygienic production of 'skin-on sheep meat' carcasses (Fisher *et al.*, 2007). This has been completed. In summary:

1. The required appearance can be produced by – shearing (pre-slaughter), singeing (3 passes through a specifically designed "ring of fire") pressure washing and "toasting" (one final pass through burners).
2. The best microbiological quality was achieved by having the final toasting step as late in the dressing process as possible (to eliminate any bacteria introduced through handling).
3. Assessment of carcasses by African consumers indicated the process could produce the required carcass and meat appearance and aroma. Pigmented skin, however, resulted in an atypical appearance.
4. Shelf life (colour, rancidity and microbiology) was equivalent to skin-off carcasses, or slightly better in terms of colour stability.

If impractical, the final toasting step need not be so late in the slaughter process, as a carcass of better microbial quality than standard skin-off carcasses can be produced in any case.

### ***Meat inspection***

To investigate whether leaving the skin on would adversely affect meat inspection, the FSA funded University of Bristol study included a data gathering exercise of predominant lesions that might pose difficulty of detection in 'skin-on' carcasses at meat inspection. This was carried out in a commercial abattoir slaughtering substantial numbers of older sheep (primarily cull ewes) (University of Bristol, 2006). The three most frequently occurring conditions noted throughout the year were, in decreasing order, abscesses, bruising and emaciation with observed total numbers of carcasses affected being 726, 42 and 28, respectively, out of a total of 10,245 slaughtered. The number of carcasses exhibiting arthritis was actually greater than those that were emaciated, with a total of 34 but the observations were not as evenly spread across months. There was only one case of the cystic stage of dog's tapeworm detected (where the cysts are found in skeletal muscle).

Abscesses exceeded 90% of all the conditions recorded in some months and the lowest value was more than 65%. It is likely that the majority of these would be detectable in a 'skin-on' carcass but there is no objective basis to qualify this statement. Abscesses are removed by localised trimming unless they are numerous enough to require condemnation of the carcass. Whilst they are not generally considered to be a public health concern, there are some that



may present a risk albeit negligible, and as such represent a consumer concern and cannot be allowed to enter the food chain.

The two other relatively commonly occurring conditions, arthritis and emaciation, would be readily detectable in 'skin-on' carcasses.

It is believed that leaving the skin on for the meat inspection procedures does present any major problems.

Fresh meat post mortem inspection procedures for skin on carcasses are currently being reviewed and post mortem data analysed further. Assessment will be carried out on a risk basis, and in addition to routine visual inspection of all visible surfaces, palpation of certain parts where abscesses most commonly occur, may be required.

### ***Medicine residues in the skin of sheep***

FSA has undertaken work to look at the issue of veterinary medicines in relation to 'skin-on sheep meat'. Medicines may be needed to control parasites in sheep, which if untreated can be a welfare issue. Withdrawal periods ensure that any residues in meat from animals, which have been treated with the medicines, are below a 'safe' limit. Withdrawal periods for sheep meat may have been calculated without including skin as it is currently removed on all sheep meat in the UK. This initial study examined how the withdrawal periods were calculated. It was concluded that insufficient data existed to assess 'skin-on sheep meat' for certain medicines. A research requirement was published on 20 September 2007 to carry out the further research.

A current study is focusing on medicines used to control external parasites and flies, which can concentrate in sheepskin and skin-fat. Sheep feet with the 'skin-on', that have been scalded and depilated, are legally available for human consumption – and these are being used as the testing product in the new study.

Data gathered from the ongoing study will help to assess the effectiveness of veterinary medicine withdrawal periods for 'skin-on sheep meat'. Withdrawal periods ensure that any medicine residues are below a 'safe' limit to protect the consumer

The ongoing research will go some way to help define the requirements for possible future production and consumption in the UK, should the meat be legalised.

### **2.3. The next steps**

It is too soon to speculate exactly when the FSA will be in a position to approach the EC to suggest a change in the current law.

The FSA have gathered evidence on meat inspection and hygiene. Further work is ongoing on the residues of veterinary medicines in the skin. This is due to be completed in the autumn of 2009. This report provides the FSA with evidence of demand.

It is expected the FSA will use the available evidence to produce a scientific report during 2009 which is expected to go with a paper to the FSA Board seeking agreement to FSA advice to Ministers to formally approach the European Commission.

So in the short term there is no prospect of the law being changed to allow approved abattoirs to produce 'skin-on sheep meat'. Consequently, the production of 'skin-on goat/sheep meat' in the UK remains unlawful. The FSA have stated that they will continue to work with local authorities to ensure that the law is enforced.

## **2.4. Section summary**

It is currently illegal to produce 'skin-on sheep meat' in the EU.

The FSA has and is conducting a number of trials to assess the hygiene and safety aspects of producing 'skin-on sheep meat'.

The findings from the FSA funded research and this report will be used by FSA to produce an evidence case supporting the change in the hygiene regulations to allow the production of 'skin-on sheep meat'.

Agreement from the FSA Board to FSA advice to Ministers to formally approach the European Commission will be sought

The process of legalising the production of 'skin-on sheep meat' is likely to take a number of years, however, it is unlikely that the demand for 'skin-on sheep meat' will wane in the mean time. Meaning that this report will be as relevant in two years time as it is today.

## **SECTION 3: THE DEMAND FOR 'SKIN-ON SHEEP MEAT'**

### **3.1. Research methods**

To estimate the demand for 'skin-on sheep meat', the following research methods were used:

#### **Method 1**

Desk-based research was conducted:

- Internet research for mention of 'skin-on goat/ sheep meat' and smoked goat meat consumption
- Analysis of papers and documents concerning 'skin-on goat/ sheep meat';
- Contact with different organisations and associations (based in the UK and in Africa); and
- Sending of questionnaires to African students within the University of Reading's School of Agricultural, Policy and Development.

#### **Method 2**

Focus group and visits.

A focus group with members of the Afro Caribbean community was conducted.

Butchers shops in the London street markets of the Elephant and Castle, Brixton and Dalston were also visited. These visits enabled the team to discuss with the traders (who allegedly sold 'skin-on goat/ sheep meat' until the more stringent enforcement and may in the future sell the product if the production and sale of the product is legalised), the demand for 'skin-on goat/ sheep meat'.

### **3.2. The 'skin-on sheep meat' attributes demanded**

The following product attributes are demanded:

- A very lean carcase. EHOs have described 'skin-on sheep meat' carcases as emaciated. Customers do not demand fat cover – they demand the bones, skin and meat;
- Either from a young goat or an old ewe;
- A particular skin type – generally a lighter skin pigment (the skin from white-faced sheep is preferred);
- Whole carcases are preferred – although UK consumers of the product will accept carcase sides (they accept mutton sides already); and
- There is little demand for the carcase to be broken down any further than this (although anecdotal evidence suggests that to serve today's 'under the counter' trade, cuts are common).

### **3.3. Eating patterns of 'skin-on sheep meat'**

#### ***Traditionally***

Most references to 'skin-on goat/ sheep meat' indicate that it is traditionally eaten relatively regularly (in terms of the volume of meat eaten within that country, dependent on income). A respondent to the questionnaire (sent to Reading university students), confirmed that they ate smoked 'skin-on sheep meat' weekly in their home country.

Internet research suggests that to a number of Nigerian tribes, goats are used as a part of sacrifice, and are also consumed during festivals, engagements and funerals. After the sacrifice, the carcass may be smoked over an open fire (singeing the skin and removing remaining hair). Goat meat is the preferred meat in Nigeria, but as with other West African countries, meat is consumed by only those who can afford to.

'Skin-on goat/ sheep meat' is commonly eaten in stews (due to the nature of the goat meat/ mutton meat being tougher, the meat tends to be stewed) and the skin acts as a stew thickener (this was confirmed by respondents to the questionnaire, and the focus group, who regularly eat cattle and sheep feet which the skin has similar thickening abilities). Other references to the smoking of goat carcasses over fires (singeing skin and smoking the meat) have indicated that the meat is fried. Where the meat is fried, it is expected to be from younger goats.

Men are thought to traditionally slaughter the animal and process the carcass, whilst women traditionally cook the meat.

All age groups traditionally eat 'skin-on goat/ sheep meat' (confirmed by a Ghanaian respondent to the questionnaire).

### ***In the UK***

The project team have been unable to speak with anybody who admits to currently buying and consuming 'skin-on goat/ sheep meat' in the UK. Anecdotal evidence suggests the following:

- Due to the high retail prices of 'skin-on goat/ sheep meat', and that the product is generally sold in whole carcass/carcass side form, 'skin-on goat/ sheep meat' is only bought occasionally. Although, due to the 'under the counter' high prices, individuals do buy cuts on special occasions.
- In the UK, mutton is typically used to produce 'skin-on sheep meat' – this meat is most palatable when slowly cooked (stewed). During the street market visits it was noted that much of the mutton/ ewe meat being sold was often described as goat meat.
- The consumer buys the product already in a 'skin-on sheep meat' form (i.e. it is ready to cook). Women predominantly cook the meat.

In the UK it is believed that 'skin-on sheep meat' is used to make stews and curries as special occasion meals. This is thought to be as a result of the high prices commanded by the suppliers. If there was an improved and consistent supply of 'skin-on sheep meat', the price could be lowered slightly, enabling 'skin-on sheep meat' to be eaten more regularly, as would traditionally be done so.

In the UK it is thought consumers of all ages will eat 'skin-on sheep meat', but the majority of consumers will be those who have lived in a 'skin-on goat meat' eating country (e.g. Nigeria) for part of their life. It is thought that there will be a lower demand from the generations of immigrant descendants who were born in the UK, because they will not have been exposed to the product, as they would have been in 'skin-on sheep meat' eating country.

### ***Religious influences on 'skin-on goat/ sheep meat' consumption***

The production of 'skin-on goat meat' as a result of sacrifice is known to occur in some African nations – but as outlined above it is thought to be eaten regularly, and sacrifice is not the main reason for consumption.

References found to religious sacrifices:

Muslims – During the Muslim holiday Eid al-Adha (Tabaski in West African language), many Muslim families in West African villages (this may also occur in more urban areas, but it is thought that those in rural areas are more likely to own goats) sacrifice a goat or a sheep. The offal is eaten on the first day of the sacrifice, whilst the carcass is smoked by an open fire. On the second day, the smoked meat is fried in oil and eaten. Photographic evidence suggests that this meat still has the skin attached.

### **3.4. The 'skin-on goat/ sheep meat' eating population**

Papers and reports that refer to 'skin-on goat/ sheep meat' indicate that people of West African origin traditionally eat them. During visits to butcher shops in London street markets this view was confirmed. It is understood that not all people of West African origin eat 'skin-on goat/ sheep meat', and that also some other nationalities eat 'skin-on goat/ sheep meat' (including certain areas in Afghanistan).

The UN states that the following countries are within the West African sub region: - Benin – Burkina Faso – Cote d'Ivoire – Cape Verde – The Gambia – Ghana – Guinea – Guinea-Bissau – Liberia – Mali – Mauritania – Niger – Nigeria – Senegal – Sierra Leone – Togo. It is known that not all West Africans eat 'skin-on goat/ sheep meat'.

Combining the findings from the research methods outlined in 3.1, it appears that individuals from West Africa (particularly Nigeria) are the potential customers for 'skin-on goat/ sheep meat'. Immigrants from Nigeria already account for a significant share of ethnic food demand in the UK.

There is also demand from Afghans and Pakistanis from the NW Frontier Provinces, who sometimes use the meat for kebabs or for whole spit roasting. Some Eastern Europeans, Koreans and Chinese are also understood to consume 'skin-on goat/ sheep meat' but in far fewer numbers than those from parts of West Africa.

The research also indicated that it is also a culinary custom for the individuals of the following West African nations to a) eat significant volumes of goat meat, or b) references have been made to the smoking of goat meat in front of an open fire:

- Benin;
- Togo;
- Ghana;
- Mali;
- Liberia (identified as eating goats head in particular); and
- Cote d'Ivoire/ Ivory Coast.

And therefore immigrants from these countries may account for some of the UK demand for the product. A respondent to the questionnaire sent to University of Reading students, from Ghana confirmed that 'skin-on sheep meat' is eaten regularly in their home country.

Contrary to belief the research indicated that it is **not** a culinary custom for individuals from the following West African nations to eat 'skin-on goat/ sheep meat':

- Guinea-Bissau;
- Guinea;
- Burkina Faso;
- Senegal;
- Sierra Leone; and
- All other African nations not listed above.

And also

- Afro-Caribbeans.

And therefore immigrants from these countries are not expected to account for a great deal of the UK demand for the product.

Focus group work carried out with the Afro Caribbean community in the Milton Keynes, Luton and Dunstable area confirmed this view, but also indicated that parts of this community used skin on cattle feet in particular (produced legally) as a thickening and taste-adding ingredient to traditional stew type dishes (as indicated below 'skin-on goat/ sheep meat' are used for the same reasons).

Many of the butchers (those selling largely to the ethnic community) in the street market areas of London (allegedly sold 'skin-on goat/ sheep meat' in the past and are potential sellers in the future) also sold large numbers of such feet, together with many other edible offal and edible co-products (such as tripes) that are less prevalent today in main stream meat outlets.

### 3.5. Where the potential 'skin-on sheep meat' eating population<sup>1</sup> live in the UK

It is likely that there will be demand for 'skin-on sheep meat' in most major towns and cities where there is a strong West African population. According to UK Remittance Market Report<sup>2</sup>, approximately 77% of the Black Africans living in the UK, live within London:

Table 1: Where the black African population live in London

Black African	% of Black African Population in UK (according to DFID report)
Islington	19
Croydon	11.5
London: City and South	10
North Kent	7
Enfield	7
Harrow	7
Romford	6.5
Uxbridge	3
Sutton	3
Hammersmith	3
% Covered by top 10 areas	77%

Source: UK Remittance Market Report

<sup>1</sup> **Potential 'skin-on goat/ sheep meat'-eating population** – this refers to the people identified as being potential consumers of 'skin-on goat/ sheep meat'. They are from / descend from 'skin-on goat/ sheep meat' eating countries.

<sup>2</sup>Remittance Market Working Group, 2005: UK Remittance Market Report.

According to Hernández-Coss et al<sup>3</sup>, 2007, 80% of Nigerians living in the UK, live within greater London. Of those living within Greater London, over 65% live within Inner London, i.e. Peckham, with the highest degree of concentration in Southwark, Hackney, Lambeth and Newham. The remainder living within Greater London live in Outer London, concentrated in Greenwich, Brent and Barnet.

The following cities have the most prevalent West African communities:

- Birmingham;
- Cardiff;
- Leeds; and
- London.

With continued migration, it is likely that the market for 'skin-on sheep meat' in cities such as Sheffield, Bradford, Bristol, Coventry, Edinburgh, Glasgow, Liverpool and Manchester, will also be significant.

### 3.6. Estimating the demand for 'skin-on sheep meat' in the UK

The following are possible methods to estimate the demand for 'skin-on sheep meat' in the UK:

**Method 1:** Estimate volume demand for London based upon previous producer and trader of 'skin-on goat/ sheep meat' estimations.

**Method 2:** Estimate the number of carcasses sold per butcher and multiply by the number of shops in the UK.

**Method 3:** Estimate the number of individual consumers.

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#### **Method 1: Estimate volume demand for London based upon previous producer and trader of 'skin-on goat/ sheep meat' estimations**

A former supplier of 'skin-on goat/ sheep meat' to these markets estimated that demand for London as a whole could be 3,000 carcasses per week (approximately 155,000/ year). However, if through legalisation of 'skin-on goat/ sheep meat' production, supply increases and the retail price falls, demand could be significantly greater.

However, this estimation is for London alone – and with no data available on the number of butcher shops (explained in method 2) that supply the 'skin-on goat/ sheep meat' eating community throughout the rest of the UK, the demand for the whole of the UK cannot be estimated.

A previous report (Southgate, 2005), maintained that approximately 20,000/ week were required to supply the market in the London area alone. This would equate to over 1 million a year. This report also states that 20,000 sets of cattle feet are sold in London each week.

Compared to the London demand volume estimates (3,000 carcasses/ week in London) of the previous supplier of 'skin-on sheep meat', 20,000 carcasses/ week to London appears to be very high. It is also unlikely that the demand for 'skin-on sheep meat' will be of a similar number to the demand of sets of cattle feet (i.e. there is already a fully established legal market for feet). It is believed that Southgate's report (2005) was a brief, snapshot study, and that 20,000 is an over estimate.

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<sup>3</sup> Source: The UK-Nigeria Remittance Corridor, challenges of embracing formal transfer systems in a dual financial environment. R Hernández-Coss & Chinyere Egwuagu Bun. 2007

## **Method 2: Estimate the number of carcasses sold per butcher and multiply by the number of shops in the UK**

During the London street market visits, there was reputed to still be a significant actual and unfulfilled demand for 'skin-on goat/ sheep meat' – and each of the meat traders spoken to estimate that if the production of 'skin-on goat/ sheep meat' was legalised they could each sell between 70 and 150 carcasses per week. It is thought that the butcher shops that largely serve the ethnic community would be the main outlets for 'skin-on goat/ sheep meat'.

Unfortunately most of these types of butchery outlets are 'off the radar' in the types of lists maintained by companies serving the meat promotional needs of the likes of the levy bodies.

These butcher shops also sold (or were principal sellers) of Halal meat, and so if they were on listings kept by the Halal food authorities their numbers could be ascertained. Unfortunately discussions with such authorities (such as the UK Halal Food Authority) indicate that although they have tried in the past to keep such lists, they currently do not do so, and so such information is not available.

In principal, local authority EHOs inspect these butcher shops and therefore, each authority should have a list of the premises it is responsible for. However the databases on which this information is stored,

- Are not centralised
- Nor kept in a common format
- Do not contain information on the types of outlet, and as a result it is hard to relate the names of businesses to their types (e.g. that of such as Mohammed Khan could be a butchers or a fast food outlet).

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## **Method 3: Estimate the number of individual consumers.**

In 2008, it is estimated that the UK was home to 5.3 million foreign-born people of all ages.

Of these, approximately 1 million were Africa-born people living in the UK<sup>4</sup>.

Of these 1 million people, an estimated 155,000 to 240,000 West Africa-born people<sup>5</sup> living in the UK in 2008 were from West African 'skin-on goat/ sheep meat' eating countries<sup>6</sup>.

Please refer to Appendix 1 for the full workings and sources for this data.

**However**, the number of West Africa-born people living in the UK, from West African 'skin-on goat/ sheep meat' eating countries could be considerably higher. **The above population figures do not include the undocumented and UK-born citizens of West African descent.** In the 1980's there was a significant wave of Nigerian migration into the UK, and it is therefore assumed that the broad range of 155,000 to 240,000 people considers the majority of West Africa-born people living in the UK, from West African 'skin-on goat/ sheep meat' eating countries. The UK-born children of the 1980's immigrants won't be included within this figure, and for this reason the higher figure of 240,000 is used to estimate demand.

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<sup>4</sup> **Africa-born people living in the UK** – This refers to people born in Africa who have since moved to the UK. This does not include descendents of these African-born people living in the UK, who were born in the UK.

<sup>5</sup> **West Africa-born people living in the UK** – This refers to people born in the West African countries listed on page 8, who have since birth moved to the UK. This does not include descendents of these West African-born people living in the UK, who were born in the UK.

<sup>6</sup> **West African 'skin-on goat/ sheep meat' eating countries/'skin-on goat/ sheep meat' eating countries** – This refers to the countries, from which 'skin-on goat/ sheep meat'-eaters are believed to originate from.



It must be noted that population statistics vary significantly – one source estimates that there are approximately 800,000 Nigerians living in the UK – if this was the case the potential number of consumers could be significantly greater.

### ***Other nationalities***

If an estimate for other nationalities (Afghans, Eastern Europeans) that may consume this product has not been estimated as there is uncertainty about which other nationalities eat 'skin-on goat/ sheep meat'. The higher figure of 240,000 potential consumers of 'skin-on goat/ sheep meat' is used to account for some demand from other nationalities.

Therefore, the potential 'skin-on goat/ sheep meat' eating population<sup>7</sup> is estimated at 240,000 people.

### ***Estimated volume of demand (based upon potential 'skin-on sheep meat' eating population)***

The specific sector of the population that would potentially consume 'skin-on sheep meat' is generally unrepresented in formal demand surveys, such as those carried out by market research companies such as Taylor Nelson Sofres (TNS) or the Government's National Food Survey.

For the purposes of estimating a total volume of 'skin-on sheep meat' demanded, it has been estimated that the 'skin-on sheep meat' eating population will eat an average of 7.5kg sheep meat (i.e. lamb, mutton and skin-on) per capita. In appendix 2, the reasons behind this have been detailed fully.

It is unlikely that consumers who currently eat mutton will revert to eating only smoked 'skin-on sheep meat' as this is entirely dependent upon the price. For the purposes of creating an estimate of demand, it is estimated that on average of up to 50% of mutton and lamb consumption (if 'skin-on goat/ sheep meat' production was legalised) will be in the form of 'skin-on sheep meat'.  $50\% \text{ of } 7.5\text{kg} = 3.75\text{kg}$  (rounded to 3.8kg). The volume of 'skin-on sheep meat' eaten will depend upon the price. If the proportion of 'skin-on sheep meat': mutton meat increased to 0.75: 0.25 (75% of mutton consumption), 'skin-on sheep meat' consumption is estimated at 5.6kg.

It is likely that some 'skin-on goat/ sheep meat' consumers will eat all of their mutton in the form of 'skin-on sheep meat', whereas others will eat none. The 3.8kg/ 5.6 kg of 'skin-on sheep meat' is an average across the total potential 'skin-on goat/ sheep meat' eating population.

The consumption per capita could be significantly greater, if the price is lower. However, it is likely that due to the limited availability of 'skin-on goat/ sheep meat' in the UK, that whilst West Africans have lived in the UK they will have eaten other, less expensive meats. It is unlikely that the 'skin-on sheep meat' eating population will stop eating the other meats all together.

The estimated potential UK annual consumption of 'skin-on sheep meat' has been calculated using the consumption per capita data estimated above. This differs whether or not consumption of 'skin-on sheep meat' is estimated at 50% of total mutton and lamb

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<sup>7</sup> **Potential 'skin-on goat/ sheep meat'-eating population** – this refers to the people identified as being potential consumers of 'skin-on goat/ sheep meat'. They are from / descend from 'skin-on goat/ sheep meat' eating countries.

consumption, or 75% of total mutton and lamb consumption. Both estimates have been used to provide a range of the volume of consumption.

If 50% of the total sheep meat consumption (by the 'skin-on sheep meat' eating population) is in the form of 'skin-on sheep meat', an estimated 912 tonnes of 'skin-on sheep meat' will be demanded. This equates to approximately **70,000 carcasses**.

If 75% of the total sheep meat consumption (by the 'skin-on sheep meat' eating population) is in the form of 'skin-on sheep meat', an estimated 1,350 tonnes of 'skin-on sheep meat' will be demanded. This equates to approximately **100,000 carcasses**.

The workings for this are included in Appendix 2.

### 3.7. Total consumption

The three methods of estimating demand were outlined in Section 3.6. The methods gave the following estimates of demand:

Method 1: Estimate of 155,000 carcasses / year

Method 2: No estimate could be made

Method 3: Estimate of between 70,000 to 100,000 carcasses/ year

A slightly higher number of consumers/ increased volume of meat eaten per person would bring the demand estimated in Method 3 to similar to the 155,000 carcasses identified as the volume demanded under Method 1. **It is therefore estimated that between 100,000 and 155,000 ewe carcasses will be required to fulfil the demand for 'skin-on goat/sheep meat' as the population stood in 2008.** Increased immigration and changing tastes could increase this demand significantly.

### 3.8. Section summary

A combination of desk and field based research, realised the following:

- A very lean carcase of an old ewe or young goat is demanded. Preferably in a whole carcase form.
- All age groups demand 'skin-on sheep meat'.
- It is traditionally eaten regularly, in stews and curries. In the UK, due to the high retail price of the product (primarily because it is illegal to produce) consumers of 'skin-on sheep meat' eat the product only on special occasions.
- Some (but not all) people of particular West African nations (Nigeria, Benin, Togo, Ghana, Mali, Liberia, Cote D'Ivoire) will potentially eat 'skin-on sheep meat' if the production is legalised. It is possible that other nationalities will also eat the product.
- The potential consumers predominantly live in London. Other key cities will include Birmingham, Cardiff and Leeds.
- All ages of the population are likely to eat the product, but those who were born within 'skin-on sheep meat' eating countries are more likely to consume the product than those born within the UK.
- It is estimated that between 100,000 and 155,000 ewe carcasses will be required to fulfil the demand if the production is legalised.
- Increased immigration and changing tastes could increase this demand significantly.

## **SECTION 4: THE SUPPLY OF 'SKIN-ON SHEEP MEAT'**

### **4.1. Current supply in the UK**

It is alleged that illegal production of 'skin-on sheep meat' does occur in the UK today, despite the risk of prosecution. The supply is made up of predominantly cull ewes. The source of these ewes is thought to be Wales, Northern England and Scotland.

Information suggests that, the current supply chain takes the following form:

1. The sheep is slaughtered and processed on-farm.
2. Either the farmer/ producer of 'skin-on sheep meat' or organised distributors of 'skin-on sheep meat', transport the carcasses to the meat markets by night.
3. The carcasses/ carcase sides are unloaded and stored within the butcher shop. They are not commonly displayed as being for sale within the shop.

It was suggested that trust must be built up between the butcher and the 'skin-on goat/ sheep meat' purchaser, before a sale will be made. This has become more common place since the enforcement has become more stringent, and the Environmental Health often use people of West African descent to stage purchases/ enquiries about 'skin-on goat/ sheep meat'.

The current volume of 'skin-on goat/ sheep meat' sold in the UK is unknown.

### **4.2. Current supply – in the EU and worldwide**

#### ***In the EU***

As in the UK, production of 'skin-on goat/ sheep meat' is illegal to produce in the remainder of the EU, due to the EU hygiene regulations.

Allegedly, illegal production does occur, and in most European countries, a 'blind eye' is turned toward the production. Allegedly the regulations are not enforced as rigorously as they are in the UK.

#### ***Worldwide***

The legislation covering the flaying of sheep and goat carcasses worldwide is unknown. Within the African countries identified as 'skin-on goat meat' eating countries, it is thought that the production does not contravene any legislation.

Australia, the largest exporter of goat meat in the world exported 'skin-on goat meat' to the UK, prior to enforcement becoming more stringent. Today they export goat meat to the US (predominantly Hispanics communities) and Taiwan. It is not thought that this meat has been processed in the way 'skin-on goat/ sheep meat' has, as outlined in this report.

The top 10 worldwide exporters of goat meat are:

- Australia;
- Pakistan;
- China;
- France;
- Ethiopia;
- New Zealand;
- Spain;
- Argentina;
- Bulgaria; and
- Saudi Arabia.

Note: It is thought that these countries export carcasses processed conventionally (i.e. not in the form of 'skin-on goat meat' as defined within this report).

#### **4.3. The potential supply of 'skin-on sheep meat' in the UK**

The supply of 'skin-on goat/ sheep meat' in the UK is likely to be sourced from cull ewes. The supply of goats in the UK would not be able to satisfy the demand for 'skin-on goat meat' (there are less than 90,000 goats in the UK<sup>8</sup>, of which many are milking goats as opposed to meat goats).

It is without doubt, that with the legalisation of 'skin-on goat/ sheep meat' production would result in a more consistent and organised supply of 'skin-on sheep meat'.

It is also recognised, that the carcasses of Welsh ewes match the attributes demanded by 'skin-on goat/ sheep meat' consumers. The carcasses are:

- Lighter;
- Leaner; and
- And those with pale/ white skin are ideal for this market.

#### ***The slaughter of cull ewes/older sheep***

The information on slaughterings at approved abattoirs of older sheep is only available from Defra as a combined total for ewe and ram slaughterings. However, 95% or more of the older sheep represented in these statistics are thought to be ewes.

The interim figures for 2008 from Defra (i.e. liable to slight revisions) show that of the total sheep slaughterings in the UK, ewe and ram slaughterings were 14% of slaughterings. This proportion of total slaughterings has remained at a similar level since 2005.

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<sup>8</sup> Defra Statistics, 2007

Table 2: Sheep slaughterings in the UK and Wales in 2008

UK 2008	Number slaughtered 000	Tonnes 000	Estimated carcass weight kg dw
Sheep and lambs	14,149.0	268.0	18.9
Ewes and rams	2,290.0	57.0	24.9
Total	16,439.0	325.0	

Wales 2008	Number slaughtered 000	Tonnes 000	Estimated carcass weight kg dw
Sheep and lambs	4,335.0	76.8	17.7
Ewes and rams	241.3	4.4	18.1
Total	4576.3	81.2	

Source: AHDBms Economics

Note: DW = Deadweight. Where data is missing, this data was unavailable from the source.

Interim figures for 2008 from Defra show that of total sheep slaughterings in Wales, ewe and ram slaughterings were 5.3%.

The lower percentage of ewe slaughterings in Wales than the national average, is not thought to be as a result of a lower culling rate, but because of two following reasons:

1. The large abattoirs killing sheep in Wales are mainly sourcing high quality lambs for the multiple retailers and export trade (i.e. those of *St Merryn (Merthyr Tydfil)*, *Dunbia* (Llanybydder), *Welsh Country Foods* (Anglesey), *Randall Parker Foods* (Llanidloes) and to a lesser extent *Fairfield Meat* (Wrexham).
2. Many cull ewes in Wales are sold through livestock markets where they are being purchased for onward shipment to abattoirs. Principally these abattoirs are in the Midlands region of England and therefore, a significant proportion of cull ewes from Wales, are slaughtered in England. The abattoirs in the Midlands region to that slaughter these ewes are mainly thought to be the large plants supplying the Halal trade (i.e. those of *M Najib & Sons* (Derbyshire), *Janan Meats Ltd* (Dudley), *Birmingham Halal Abattoir Ltd* (Birmingham), *Melton Meat Ltd* (Leicestershire) and to a lesser extent Euro Quality Lambs Ltd (Shropshire)). It is thought that during the Muslim festival seasons other plants from further a field will be buying cull ewes from Wales (e.g. those of *Forge Farm Meats* (Kent), *Osset Abattoir Services Ltd* (West Yorkshire) as well as the smaller specialists, such as *Simply Halal* (Buckinghamshire), *Medina Meat and Poultry Group* (Halifax), *Cheshire Halal UK* (Cheshire)).

*Janan Meats* and *Birmingham Halal* are known to supply mutton to the butchers on the London street markets (their names were mentioned a number of times during the visit). *Janan Meats* was used in the FSA/ Bristol University trials looking in to the health and technical issues involved in producing 'skin-on sheep meat'.

### ***The potential cull ewe supply***

It is estimated that in 2008, 2.29 million breeding sheep (predominantly ewes) were slaughtered in the UK, from a breeding flock of 15.5 million sheep. Total ewe and ram slaughterings for GB in 2008 were 2.27 million.

It is estimated that in 2008, 630,000 breeding sheep from Wales were slaughtered in the UK, from a breeding flock of 4.2 million sheep.

See Appendix 3 for full calculations and sources.

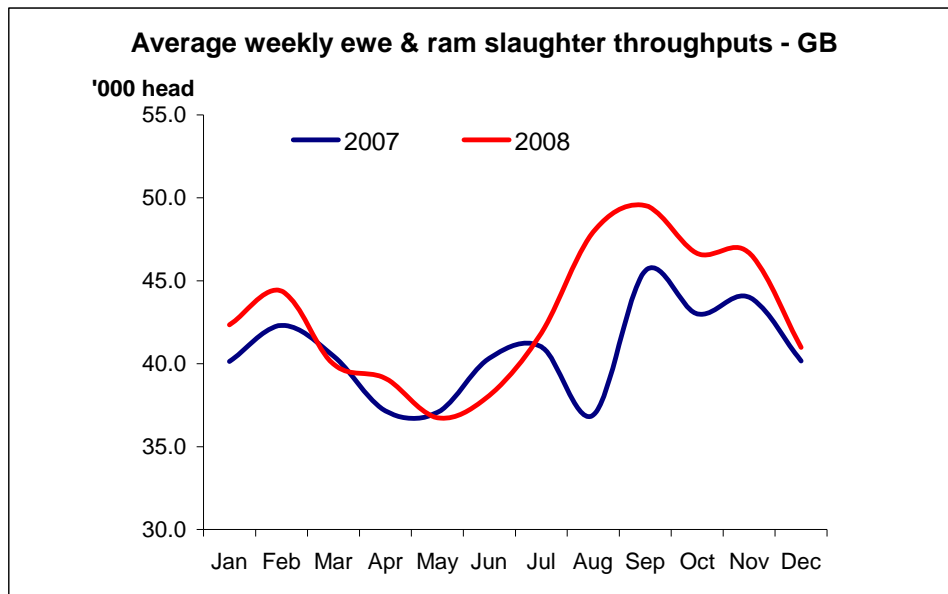
The report has recognised that there is potential demand for approximately 155,000 ewe carcasses for 'skin-on sheep meat' production. This is approximately 25% of the cull ewes from Wales slaughtered in 2008.

### ***Average numbers of cull ewes per holding***

If the demand for 'skin-on sheep meat' only represents 25% of Welsh cull ewes, not all Welsh cull ewes will be slaughtered for this product.

There were 15,094 holdings<sup>9</sup> in Wales that kept sheep in 2008. If there were 642.2 thousand ewes and rams from Welsh holdings slaughtered in 2008, this is an average of 43 cull ewes per holding, per year. To make up the 155,000 ewes required, approximately 4,000 farmers would be needed.

### ***Timing of supply***



Source: AHDBMS Economics

As can be seen in the above graph, there was a supply of over 30,000 ewes per month for slaughtering throughout 2008 in GB, proving that there would be sufficient supply to produce all-year round 'skin-on sheep meat'. 28% of the GB's ewes and rams slaughtered in 2008 were from Wales. Therefore an estimated 8,500 Welsh ewes could be slaughtered per month for the 'skin-on sheep meat' trade.

<sup>9</sup> Census data is collected on a per holding basis (there may be a number of farms under one holding). Source, Welsh Statistics: <http://new.wales.gov.uk/statsdocs/agriculture/farmfact08e.pdf>

#### 4.4. The market value of cull ewes

##### *Cull ewe prices (£ per head live weight)*

Data on the value of cull ewes is only available for ewes sold live weight (i.e. generally sold through auction markets), and the values are expressed as pounds per head. Less than 600,000 cull ewes were sold through auction markets in the year 2007/2008 in GB (AHDBMS Economics). In GB there were 2.268 million ewes and rams slaughtered in 2008. Approximately 25% of ewes were marketed through auction markets in 2008.

The average price per head for cull ewes sold through auction markets in GB and Wales were as follows:

Table 3: Average liveweight prices for cull ewes

	£ Per Head
<b>GB</b>	
2008	32.96
2007	28.61
W/e 24/01/09	40.79
W/e 26/01/08	26.37
<b>Wales</b>	
2008	27.48
2007	23.77
W/e 24/01/09	33.71
W/e 26/01/08	21.97

Unfortunately, there is no published data available other than averages. The cull ewes that will be used to produce 'skin-on sheep meat' are very lean (with a low amount of meat on them) and have very little fat on the carcass. These ewes that produce a carcass of this type would typically be of low value (probably below the £15 value). Mutton sides of this quality currently retail at between £15 and £30. If processed to produce 'skin-on sheep meat', the sides could be retailed at an even higher price.

#### 4.5. Section summary

The carcass of older ewes meets that demanded for 'skin-on sheep meat' production.

642,200 Welsh breeding sheep were slaughtered in 2008, of which 95% are estimated to have been ewes.

Approximately 25% of these sheep could be used to serve the 'skin-on sheep meat' market.

There is sufficient year round supply of cull ewes to enable year round production of 'skin-on sheep meat'.

Approximately 25% of cull ewes (from GB) were marketed liveweight, through auction markets in 2008.

It is thought that the small, lean, low fat carcasses demanded for 'skin-on sheep meat' production are valued at less than £15/ head in auction markets.

## SECTION 5: 'SKIN-ON SHEEP MEAT' PROCESS IMPLICATIONS

### 5.1. Process implications for farmers

To produce this product, farmers will have to abide by all other on-farm requirements prior to slaughter, including meeting withdrawal periods of veterinary medicines prior to slaughter and cleanliness.

However, based on the FSA research studies other requirements will be needed:

- Sheep will need to be shorn before the singeing phase. Shearing will be done on the live animal. To avoid unnecessary stress to the animal prior to slaughter (protecting both the animals welfare and the meat quality), the sheep should be shorn two weeks before slaughter.
  - The animal will need to be selected for slaughter at least two weeks in advance.
  - A trained shearer (probably the farmer themselves) will need to shear the ewe to a wool length of 5mm, avoiding cutting the animal.
  - The wool will need to be disposed of (i.e. the farmer must assess if it is worthwhile storing fleeces off just a few cull ewes).
  - During wet and cold conditions shelter must be provided to the ewe. If housed, care must be given to not finish the ewe too much – the farmer must be reminded that lower fat carcasses are demanded – for the 'skin-on sheep meat' trade any extra finish to the carcass may not necessarily result in a significantly better return.
- When the sheep is shorn, it must not be marked (i.e. no marking fluids, powders, sticks, crayons or sprays to be applied to the body). This will avoid the skin being discoloured and the possible adversity to this from the consumer.
- Care must be taken when injecting ewes, as the mark from where the needle was inserted may be visible on the skin to the consumer. It is important that there are no intramuscular or subcutaneous injections into the rump – particularly within a few months prior to slaughter.
- Research is currently underway in a FSA funded research project to assess the impact of pour-on anthelmintic treatments on the skin.
- To affirm that withdrawal periods have been met, accurate veterinary records will need to be maintained. There is a cross-compliance requirement for producers to do this. Many producers are also members of Farm Assurance Schemes where there is also a requirement to maintain records of this type.

It is advised that if the production of 'skin-on sheep meat' were legalised, that a set of standards for producers is created, and that there is a requirement to meet these. The financial return from the production of 'skin-on sheep meat' will be significant enough to warrant any increases in labour and changes on practice. Section 6 outlines the estimated returns to retailers and abattoirs. In order to encourage producers to change practices, abattoirs will need to pass returns down the supply chain.



## 5.2. Process implications for abattoirs

### ***Research***

The University of Bristol was recently commissioned by the FSA to carry out a study to determine a hygienic process method to produce the required product<sup>10</sup>. The FSA aims for undertaking the research were stated as if it could be shown that the 'skin-on' carcass could be produced in a safe and repeatable manner it could be a step towards legalising the process. The FSA provided us with a copy of the final report and this section has been written after discussions with the researchers and summarising the details of the final report.

### ***Process***

The project tried many different methods and the following gave the most controllable and consistent results. The first step is to shear the sheep to a wool length of approx 5mm prior to slaughter. After slaughter the complete carcass (less-feet) is singed with a naked gas flame, followed by pressure washing to remove any charred wool residue. The head is then removed and the carcass is eviscerated, split, inspected and subjected to a second singe, or "toast" as the researchers described it. This second "light singe" or toast is required to dry the surface and give it the required colour characteristics. In addition the study showed that this step has the added benefit of reducing the surface contamination created by the manual handling during the evisceration, splitting and inspection stages. Refer to figure 1 for the proposed flow for 'skin-on sheep meat' production.

### ***Slaughterline changes***

It is unlikely that a slaughterline would be constructed to process only 'skin-on' sheep so additional equipment would have to be located at the appropriate points along the conventional line. This is not as easy as it sounds as the carcass changes position at various stages along a modern inverted dressing line and this may result in the carcass being in the wrong orientation for the process. For example the carcass is normally suspended by one back leg during bleeding and then transferred to a three or four leg "hammock" suspension for head removal and preparation of the fleece for pelting. The carcass would then be inverted and suspended by its fore legs for pelt removal. If the pelter is to be replaced by the main singer further research is required to determine if the carcass can be suspended from a single back leg during the singeing process without the 'free' leg shielding areas of the fleece. If this were not possible the carcass would have to be suspended by both back legs. The carcass would then be re-suspended by its back legs in preparation for evisceration and chilling. The report from the FSA project at Bristol University (M01027) includes helpful illustrations to enable the process to be visualised.

**Main Singer** – similar to a pig singer but smaller. An area of 3m x 3m would provide space for the equipment with safety zone and service access.

**Pressure Wash** – manual or automatic with overspray shields and waste collection facilities. As with the singer an area of 3m x 3m would provide space for the equipment and operator.

**Toaster** – Although not as fierce as the Main Singer it will have to incorporate the same safety and service access so another 3m x 3m would be appropriate.

As with all slaughterlines it is rare to find two the same so each installation will require individual design and engineering.

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<sup>10</sup> Source: A practical investigation into the hygienic production of 'skin-on' sheep carcasses and cattle and sheep feet. Project code: M01027 available from the FSA by contacting mary.howell@foodstandards.gsi.gov.uk.

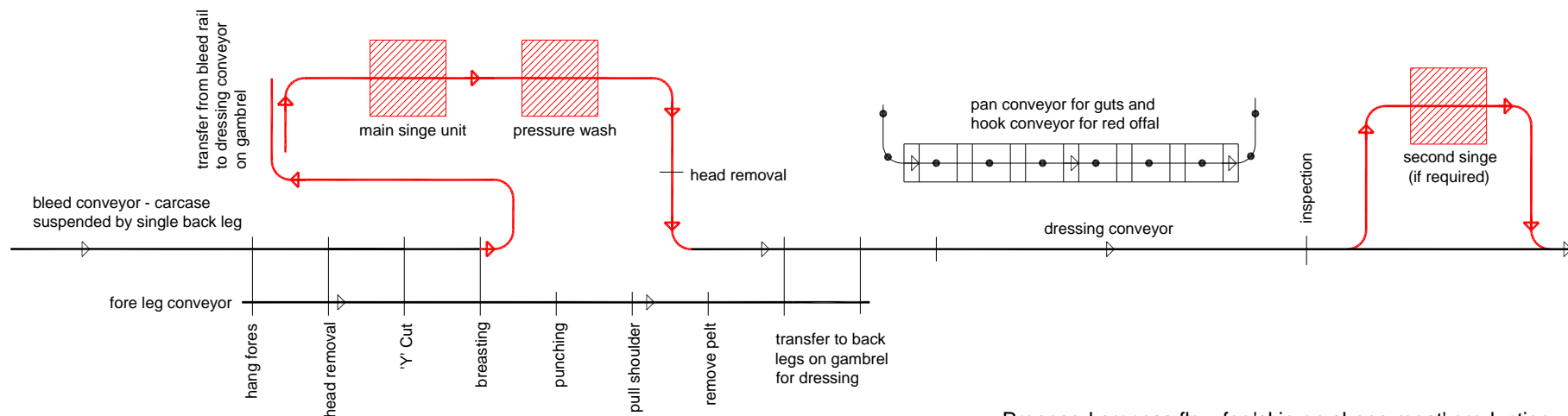
As with the standards to be devised and then used by farmers, there should also be a set of best practice standards to be used by abattoirs.

### **5.3. Section summary**

There will be extra requirements for both producers and processors for the production of 'skin-on sheep meat'.

Producers will be required to shear sheep two weeks before slaughter – and alter practices to accommodate this (i.e. select in advance, and provide shelter).

There will be a requirement for meat processors to organise the order of process on the slaughterline to be slaughter – singe – pressure wash – head removal – eviscerate & dress – inspect – toast/ second singe.



### Proposed process flow for 'skin-on sheep meat' production.

The bled shorn carcase would by-pass the usual pelt removal preparations and continue on a new extended bleed line until it is transferred to the new dressing line extension on a standard rear leg gambrel. The carcase would then pass through the singer and wash station before re-joining the main dressing line for evisceration as normal. Following evisceration the carcase would divert to pass through the second singer (should this be required). All additional equipment is shown red.

Figure 1

## SECTION 6: EQUIPMENT INVESTMENT AND RETURNS

### 6.1. Equipment investment

To singe and wash the carcasses for 'skin-on sheep meat' production, investment in equipment will be required by the abattoir. The cost of the equipment required to produce 'skin-on sheep meat' has been assessed from quotations from machinery manufacturers (in particular German manufacturers of singers for the pig industry). The estimated costs are based on new equipment, which will allow a reasonable throughput, in a medium sized abattoir.<sup>11</sup>

As shown during the trials undertaken at Bristol University, it is possible for abattoirs to build or adapt existing equipment, thus the cost may be reduced from that stated below.

First singer = approximately £50,000<sup>12</sup> (this allows approximately £43,000 for the singer, supplied and fitted + £7,000 for an insulated chimney and to make a hole in the roof);

Spray wash = £5,000;

Second singer = as above, approximately £50,000; and

Rail and conveyors = approximately £20,000, depending upon the site layout.

Total cost = **£125,000**

Savings could be made if:

1. The business constructs their own singer;
2. Only one singer is required (i.e. for the toasting process, the carcass could be passed back through the singer). The risk of cross contamination would need to be assessed before allowing this. However, the trials undertaken at Bristol University used the same singer twice; and
3. There are few alterations to rails and conveyors.

Assuming one singer is purchased at a cost of approximately £50,000, this could bring the costs to approximately **£75,000**.

Apart from the costs incurred through equipment investment, there are potential cost increases from the following sources:

- Labour – there may be some increases in labour per carcass, but it is not thought to be significant (not significantly greater than that already required to remove pelts).
- More room would be required within the plant to accommodate extra machinery and a separate line to the conventional process.
- There may be a requirement for 'skin-on sheep meat' carcasses to be stored separately/ not to come into contact with conventionally produced carcasses. Any practices that differ to those conventionally used may incur time and therefore expense.

### 6.2. Retail value of carcasses

Anecdotal evidence suggests that 'skin-on sheep meat' carcasses sold on the black market can fetch in the region of £80 - £100 per carcass. This compares with legally retailed mutton carcasses (of a similar standard) reaching in the region of £18 - £25 per carcass side (£36 - £50 per carcass).

As with most products of a limited supply but in high demand, the retail price of 'skin-on sheep meat' carcasses in the UK are thought to be high.

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<sup>11</sup> A medium sized abattoir is defined in this report as slaughtering 5,000 to 30,000 cattle units/ year (1 cattle unit = 10 sheep units)

<sup>12</sup> The smaller singer model BF1-N (for natural gas) is 48,623 Euro supplied and fitted. Details are under the 'final treatment' pig section <http://www.banss.de/englisch/sites/index.htm>

If the production of 'skin-on sheep meat' were legalised, the supply would increase. A previous supplier of 'skin-on sheep meat', who was met during the course of this study, made clear their intentions of producing 'skin-on sheep meat' in their meat plant if the process was legalised.

If the supply of 'skin-on sheep meat' were to steadily increase, the product will continue to generate a premium. If the production of 'skin-on sheep meat' increases too quickly, and the product floods the market exceeding demand, it is likely that the product will be retailed at a lower price.

The cost of equipment will be a limiting factor in the supply of 'skin-on sheep meat'. The costs will restrict some plants from investing. It is possible for plants to construct their own equipment/ possibly buy from a cheaper source, reducing the equipment cost.

It is likely that after an initial increase in supply, supply will increase gradually, either as the process becomes more efficient or plants realise the benefits of the production and begin 'skin-on sheep meat' production. Those who have little current knowledge of the process or the market are unlikely to rush into production.

### **6.3. The return from the investment**

If the average retail value of 'skin-on sheep meat' were estimated to be approximately £20/ carcass above the average retail price for a conventional mutton carcass, a proportion of this would be reflected in the price received by the abattoir. Some of the premium generated through 'skin-on sheep meat' production will need to be passed back to the farmer, as a means of encouraging them to meet the requirements (including shearing two weeks before slaughter).

For the purposes of estimating the return from the investment, it is assumed that the retailer takes a cut of £5, the abattoir £10 and the producer £5. In practice, both the average retail premium and the premium to the abattoir could be greater than this.

Based upon this, if the ewes are sourced solely from Wales, and slaughtered solely in Welsh abattoirs, the premium/ head for the Welsh red meat industry (retailer, abattoir and producer) would be £20.

The increased income to the Welsh red meat industry from the legal production of 'skin-on sheep meat' would be **£3.1 million** (£20 x 155,000 carcasses).

#### ***Covering the cost of the equipment***

Based upon an equipment cost of £75,000 for 'skin-on sheep meat' production, and an increased income of £10/ head for 'skin-on sheep meat' carcasses over conventionally produced carcasses; an abattoir must process and market 7,500 ewes to cover the equipment cost.

#### **6.4. Section summary**

To singe and pressure wash carcasses, there is an equipment cost to the abattoir. Total costs have been estimated at between £75,000 and £125,000. Any practices that differ to those used to produce conventional carcasses may incur time and therefore expense.

It is estimated that the retail value of 'skin-on sheep meat' carcasses over conventional mutton sides, generates a premium of at least £20/ carcass. Due to the investment costs associated with equipment, the abattoir should receive at least £10 of this premium, with the remainder split between the producer and retailer.

With a minimum premium of £20/ carcass, the production of 'skin-on sheep meat' could generate a £3.1 million premium to the Welsh red meat industry (retailer, abattoir and producer).

An abattoir would need to slaughter 7,500 ewes for the 'skin-on sheep meat' trade, to cover the cost of equipment.

## **SECTION 7: SUMMARIES AND CONCLUSIONS**

### **7.1. A summary of the opportunities**

The report has identified that there is the opportunity for the Welsh red meat industry to generate increased revenue of £3.1 million. This is through the processing of mutton carcasses to produce 'skin-on sheep meat'.

The alleged current illegal production of 'skin-on sheep meat' may contravene a number of different regulations that could be harmful for human, animal and environmental health. Through the legalisation of the process, the processing would be done in approved abattoirs in a hygienic manner.

The production of 'skin-on sheep meat' offers an alternative outlet for low quality cull ewes, that would otherwise be destined for the Halal trade. This competition for product may in turn force cull ewe prices to increase, which would be of benefit to the producer.

By moving from the traditional processing methods used in the UK, to those commonly used in other countries of the world (whose population now represent a significant community in the UK), a premium would be generated for the whole supply chain. Abattoirs, who would be required to purchase equipment, therefore generating significant costs, would take the predominant share of the premium. However, farmers also will be required to alter their practices to accommodate the demands for the product, and they too should receive a premium.

There is a significant demand for this traditional, West African meat product. For the purpose of this study, the demand was estimated at 155,000 ewe carcasses. This is approximately 25% of Welsh ewes slaughtered in 2008 (a significant proportion were slaughtered outside of Wales).

The production of 'skin-on sheep meat' would enable a number of abattoirs to produce and market a premium product, at a cost of approximately £75,000. With slaughterings in Wales's decreasing year on year, the opening up of a new market will bring much needed revenue to not just producers, but abattoirs also. This would be of benefit to local employment and the local economy.

### **7.2. A summary of the threats**

The report has identified the opportunities of the 'skin-on sheep meat' market, and a number of threats have already been identified, including:

- There is a risk of production exceeding the demand for 'skin-on sheep meat', and therefore the retail price is lowered. However, if the production is done so in a controlled manner (likely to be controlled by the cost of the investment required), it is unlikely that the market will be flooded with the product.
- Whilst competition with the Halal trade for ewe carcasses could increase prices (for live ewes as opposed to carcasses) and benefit the industry, if prices increase significantly there is a risk that consumers will revert to lower cost meat.

Among the threats not already stated in the report, the threat of imports has not been discussed in detail.

Australia, the largest exporter of goat meat, and previous exporter to the EU of 'skin-on goat meat', are likely to look to export product into the EU and the UK if legislation is altered to allow this. Imports from Australia did occur before enforcement became more stringent, and if their product can be produced at a lower cost than that produced in Wales or the rest of

the UK, it will influence the returns to the Welsh red meat industry. There is also a risk of goat meat from the goat meat exporting countries listed in section 4.2, and cull ewes from countries such as New Zealand to be processed to produce 'skin-on goat/ sheep meat' and therefore be in direct competition with Welsh produced 'skin-on sheep meat'. The legal position of this process in these countries is not known.

There is also a threat that part of the demand for 'skin-on sheep meat' will be satisfied using English or Scottish lambs. There is also the risk that the Welsh ewes could be slaughtered in English abattoirs. This would be because of few abattoirs in Wales likely to be able to produce 'skin-on sheep meat', as a result of the plant:

- Being too small to justify the investment;
- Having a limited spare capacity to be able to slaughter a minimum of 7,500 ewes without affecting other customers/markets;
- Large and specialised, and unlikely to be interested

There is also the risk that with 'skin-on sheep meat' being a relatively new product to the UK (if legalised), any mistakes, in terms of quality or safety will deter potential consumers. Development of trust in this 'new' product will be required.

### **7.3. Conclusion**

The purpose of this report was to identify and appraise the opportunities available to the Welsh red meat industry, through the potential legalisation of 'skin-on sheep meat' production.

For the purpose of this study, estimates of the demand of the product have been made. It has been estimated that up to 155,000 ewe carcasses or 25% of the Welsh ewes slaughtered each year, could be processed to produce 'skin-on sheep meat'. This is a significant proportion of Welsh ewes that would otherwise be of a low commercial value (to both the farmer and to the retailer). With a premium of £20 per carcass for 'skin-on sheep meat' carcasses over conventionally processed mutton carcasses, there is the opportunity for the Welsh red meat industry (retailer, abattoir and producer) to generate a significant premium, of approximately £3.1 million.

The success of amending the regulations largely depends upon the remaining studies being carried out for the FSA to enable them to submit a dossier of supporting scientific evidence to the European Commission. From the demand side alone, it is without doubt in the interests of the Welsh red meat industry to approach the EC to reconsider its position on the legalisation of this process.



## APPENDICES

### **Appendix 1 - Estimating the number of individual consumers**

In order to make this section easier to understand, the following terms are used:

**Africa-born people living in the UK** – This refers to people born in Africa who have since moved to the UK. This does not include descendents of these African-born people living in the UK, who were born in the UK.

**West Africa-born people living in the UK** – This refers to people born in the West African countries listed on page 8, who have since birth moved to the UK. This does not include descendents of these West African-born people living in the UK, who were born in the UK.

**Nigeria-born people living in the UK** – This refers to people born in Nigeria who have since moved to the UK. This does not include descendents of these Nigerian-born people living in the UK, who were born in the UK.

**West African 'skin-on goat/ sheep meat' eating countries** – This refers to the countries, from which 'skin-on goat/ sheep meat'-eaters are believed to originate from.

**Potential 'skin-on goat/ sheep meat'-eating population** – this refers to the people identified as being potential consumers of 'skin-on goat/ sheep meat'. They are from/ descend from 'skin-on goat/ sheep meat' eating countries.

#### ***Number of foreign-born people living in the UK***

In 2001 the UK was home to about 4.9 million<sup>13</sup> foreign-born people of all ages. Between 1951 and 2001, the foreign-born population had increased on average by 56,000 people per year (1951 = 2.1 million, 2001 = 4.9 million). Assuming the foreign-born population continued at this rate, it is estimated that in 2009, the UK was home to 5.35 million foreign-born people of all ages.

#### ***The number of Africa-born people living in the UK***

Two methods of estimating the number of Africa-born people living in the UK have been used:

##### **1.**

The below is taken from Hernández-Coss et al<sup>14</sup>;

In 2006 - The largest proportion of UK's current migrant population was born in other countries within the European Union (23 percent), followed by those from the Indian subcontinent (20 percent), and Africa (19 percent – approximately 1 million people). In Africa the majority of remittances from the UK go to Ghana, Kenya, Nigeria, Somalia and South Africa. This suggests that a significant proportion of West Africa-born people living in the UK were born in Ghana and Nigeria.

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<sup>13</sup> Source: National Statistics, 2001 Census

<sup>14</sup> Source: The UK-Nigeria Remittance Corridor, challenges of embracing formal transfer systems in a dual financial environment. R Hernández-Coss & Chinyere Egwuagu Bun. 2007

## 2.

According to the Annual Abstract of Statistics<sup>15</sup>, an estimated 790,000 mixed African, and Black African people lived in the UK in 2006.

Table 4: Population by ethnic origin

		People (000)
White		51,364
Mixed	White and Black African	76
Black	Black African	714

Source: <sup>16</sup>

It is therefore estimated that in 2006 there were between 800,000 and 1 million Africa-born people living in the UK. For 2008 estimates, the higher figure of 1 million is used.

### ***West Africa-Born people living in the UK***

Two methods of estimating the number of West Africa-born people living in the UK have been used.

#### 1.

To estimate the number of West Africa-born people living in the UK, the proportion of acceptances for settlement in the UK has been applied to the number of Africa-born people living in the UK.

According to the Office of National Statistics<sup>17</sup>, of the 32,230 Africa-born people that were accepted for settlement in the UK in 2006, over 26% were from the following West African nations:

- Nigeria (14%)
- Ghana (9%)
- Sierra Leone (3.6%)

Table 5: Acceptances for settlement in the UK in 2006

	2006
Africa: total	32,230
Angola	980
Dem. Rep. Congo	1,190
Ghana	2,910
Kenya	1,685
Nigeria	4,510
Sierra Leone	1,160
Somalia	2,125
South Africa	5,675
Uganda	685
Zimbabwe	3,420

More than 75% of acceptances for settlement of Africans in the UK in 2007 were from those countries listed above. Less than 25% of immigrants were from the remaining African countries. Less than 1% of acceptances for settlement are thought to have been from the West Africa-born people living in the UK from 'skin-on goat/ sheep meat' eating countries.

<sup>15</sup> Source: Annual Abstract of Statistics, No 144, 2008 edition

<sup>16</sup> Source: Annual Abstract of Statistics, No 144, 2008 edition

<sup>17</sup> Office of National Statistics – AAS 2008, taken from Whitaker's Almanac 2009

It is therefore estimated that 24% of Africa-born people living in the UK were born in the West African 'skin-on goat/ sheep meat'-eating countries (this excludes Sierra Leone).

$24\% \times 1,000,000 = 240,000$  people.

## 2

Based upon the number of Nigeria-born people living in the UK (instead of by Africa-born population living in the UK).

According to Hernández-Coss et al<sup>18</sup>, 2007, there are approximately 90,000 Nigeria-born people living in the UK. Based upon proportions from the above table an estimated 155,000 West Africa-born people living in the UK were from West African 'skin-on goat/ sheep meat' eating countries.

According to The UK Remittance Market Report (2005), there were between 77,000 and 82,000 Nigeria-born people living in the UK. This will have increased between 2005 and 2007 (by approximately 4,000/year according to the ONS<sup>19</sup>), so evidence suggests that the figure of 90,000 Nigeria-born people living in the UK is correct.

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<sup>18</sup> Source: Source: The UK-Nigeria Remittance Corridor, challenges of embracing formal transfer systems in a dual financial environment. R Hernández-Coss & Chinyere Ekwuagu Bun. 2007

<sup>19</sup> Office of National Statistics – AAS 2008, taken from Whitaker's Almanac 2009

## **Appendix 2 - Estimated volume of demand (based upon potential 'skin-on sheep meat' eating population)**

For the purposes of estimating a total volume of 'skin-on sheep meat' demanded, it has been estimated that the 'skin-on sheep meat' eating population will eat an average of 7.5kg sheep meat (i.e. lamb, mutton and skin-on) per capita.

This has been estimated based upon the following factors.

- Smoked 'skin-on goat/ sheep meat' is more likely to be eaten in the home, so per capita household meat purchase data has been used. This is considerably lower than estimates for total meat consumption (approximately 71kg).

Table 6: Household meat purchases per capita (Kg)

2008	Beef & Veal	Mutton & Lamb	Pork & Bacon	Poultry Meat	Other Meat/Offal	Total
London	4.7	2.1	5.3	9.7	0.4	22.2
Midlands	4.9	1.8	6.2	9.4	0.4	22.7
<b>GB</b>	<b>5.0</b>	<b>1.7</b>	<b>6.1</b>	<b>9.2</b>	<b>0.4</b>	<b>22.4</b>

Source: AHDB Meat Services Economics

As stated in the above table, the annual home-consumption of meat is 22.4kg. Assuming a significant proportion of 'skin-on goat/ sheep meat' eaters are Muslims (evidence suggests that Islam is a predominant religion in West African, 'skin-on goat/ sheep meat' eating countries; and pig meat is Haraam), pork and bacon consumption is not thought to be significant.

- Goat meat is traditionally eaten above other meats in West Africa, so for this reason alone volume could be as high/ higher than other meat consumption.
- West Africa-born people living in the UK commonly eat offal, particularly feet and tripes. Beef is also eaten, but due to its cost in the UK it is likely to be the cheaper cuts/ less is eaten.
- West African people also consume significant volumes of poultry meat (smoked and unsmoked).

Table 6 has been revised (to give table 7), taking account that the meat categories:

- Poultry meat,
- Sheep meat
- Offal (and other meat)

Represent the most significant proportions of meat eaten in the home by West African people. This has been done solely to create an estimate, and is not from a published source. This is based upon the knowledge of the project team.

Each meat category is thought to be equally important for the identified *potential 'skin-on goat/ sheep meat' eating population* and for this reason the total meat consumption of 22.5 kg has been equally divided between each meat category. The importance of each category is known as a result of visits to London meat markets, and witnessing the volumes of each meat category on sale.

Table 7: Estimated home consumption of meat per capita (kg) by potential 'skin-on sheep meat' eating population– revised table

Estimated 2008	Mutton & Lamb	Poultry Meat	Other Meat/Offal (incl beef)	Total
<b>GB – West African</b>	<b>7.5</b>	<b>7.5</b>	<b>7.5</b>	<b>22.5</b>

No Source – based upon project team assumptions.

The estimated potential UK annual consumption of 'skin-on sheep meat' has been calculated using the consumption per capita data estimated above. This differs whether or not consumption of 'skin-on sheep meat' is estimated at 50% of total mutton and lamb consumption, or 75% of total mutton and lamb consumption. Both estimates have been used to provide a range of the volume of consumption.

Workings:

**If 50% of sheep meat consumed is smoked:**

50% of 7.5Kg/ head = 3.8 kg/ head

240,000 people x 3.8 kg = 912,000 kg meat

Ewe carcass = 18.1kg, of which 75% is edible (lean meat, fat and skin) = 13.5 kg per carcass

912,000/13.5 = approximately 70,000 carcasses.

**If 75% of sheep meat consumed is smoked:**

75% of 7.5Kg/ head = 5.6 kg/ head

240,000 people x 5.6kg = 1,350,000kg meat

Ewe carcass = 18.1kg, of which 75% is edible (lean meat, fat and skin) = 13.5 kg per carcass

1,350,000/13.575 = approximately 100,000 carcasses.

Carcass weight based upon:

- Average Welsh carcass weight of 18.1kg for Ewes and Rams – AHDBMS Economics
- An estimated 75% of the carcass and pelt would be edible, Hart et al, 1997<sup>20</sup>

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<sup>20</sup> Hart R. J, Church P. N, Kempster A. J & Matthews K. R, Audit of bovine and ovine slaughter and by-products sector (Ruminant Products Audit), May 1997. In this report, of a 17.8kg lamb carcass + 1.7kg pelt, Lean meat, subcutaneous fat and intramuscular fat and pelt account for over 80% of the carcass (+pelt) weight. For older sheep it is expected that the proportion of bone and waste will be higher, and the fat content may be lower than in a lamb, and for this reason 75% of the carcass + pelt are estimated as being edible.

### **Appendix 3 - The potential supply of Welsh cull ewes**

Potential cull ewe availability from Wales can be estimated by applying the culling rate for the UK to the Welsh flock.

I.e.

The UK breeding flock in June 2008 was estimated at 15.55<sup>21</sup> million sheep

Ewe slaughter 2008 = 2.290 million head

Culling rate = 15%

The Welsh breeding flock in June 2008 was estimated at 4.196 million head<sup>22</sup>.

If the culling rate in Wales were similar to the UK culling rate of 15%, ewes from Wales available for slaughter is estimated at approximately 630,000 (the actual slaughter of ewes and rams in Welsh abattoirs in 2008 was 241,000). 630,000 is approximately 28% of UK cull ewe slaughterings.

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<sup>21</sup> Defra Statistics

<sup>22</sup> Welsh Assembly Government Statistics

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