CHEMICAL PROPERTIES OF THE MEAT AND BLUBBER OF THE CAPE FUR SEAL (*ARCTOCEPHALUS PUSILLUS PUSILLUS*)

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Background

The Cape fur seal is harvested commercially in Namibia on the south-west coast of Africa. At present, there is a large demand for the hides of the pups and bulls, but the rest of the carcass is processed to carcass meal, which was traditionally used to supplement the diets of ruminants. Due to the occurrence of BSE in previous years, there has been a decrease in the use of animal by-products in any animal feed. Therefore, an alternative use of the meat is desirable. As the meat has shown to be a healthy, lean meat which contains high amounts of macro-minerals such as calcium and phosphorous, as well as iron and selenium (Robinson, 1996), there is reason to process the meat into a human food source. This would make the harvesting a more acceptable occurrence, as it would mean that the entire carcass of the animal would be utilised to its full extent and that this would be a supply of nutritious meat to the consumer.

There has been very little research done on the meat qualities of marine mammal meat, and none could be sourced on the meat of the Cape Fur Seal (*Arctocephalus pusillus pusillus*). There is some literature available on other pinnipeds, their physiology, geography, environment and life cycles. Some of it is comparable to the Cape fur seal, but as the Cape fur seal is a sub-species of sea lion, there are characteristics, which do not compare to other marine mammals.

Fish oil capsules have become a sales success in the pharmaceutical industry and a well-established supplement in the diet of many people around the world. The omega-3 fatty acids in fish oil have been proven to have a prophylactic action on thrombosis as well as the hardening of arteries. Experiments have shown that the consumption of whale and seal oils leads to a less aggressive immune system and that it also influences the viscosity and coagulative properties of the blood (NAMMCO, 1998).

There are already a few seal products, such as leather products as well as meat products, available elsewhere in the world, which are sold commercially. Seal meat is canned, or processed into salami as well as other products. The seal oil is widely used in the cosmetic industry as an ingredient in medical products. The leather from the hides of mostly male animals is used to make briefcases, purses, wallets and other clothing items. In Namibia, shoes are already being produced successfully from the hides of harvested bulls. The fur of the pups is used in the clothing industry and is used in coats, hats and boots.

The Cape fur seal is harvested commercially each year in Namibia, and this sustainable harvesting is destined to continue. The current culling numbers are 30 000 pups per year and 3000 bulls. The harvesting is done according to regulations and is strictly monitored.

Objectives

Maximising these seal resources would benefit Namibia as well as the rest of the world. Information is needed on the dress out percentages, chemical characteristics of the meat and blubber and how these would influence any processing methods used in a production line. The age and gender of the animals used for production purposes will also play a role, and this also requires research and information. The present investigation determines the proximate chemical composition of the *Pectoralis* muscle and the blubber of mature male bulls as well as pups.

Materials and methods

Ten Cape fur seal pups, approximately eight months old, of both sexes as well as ten Cape fur seal bulls, between two and four years of age were used for this investigation. As selective harvesting is not allowed,

the pups were not separated into different gender. All pups were of similar age, all at point of weaning. The bulls were also of similar age although none were sexually mature.

The animals were harvested using standard procedures. This includes being stuck in the heart to bleed within 30 seconds of being stunned by clubbing. The animals were eviscerated and the hide removed. At this point 100g samples of meat was collected from the *Pectoralis* muscle as well as 100g of blubber from the ventral side of the carcass. Samples were collected in separate plastic bags and marked according to animals, vacuum packed and frozen at –5°C once the meat samples had all reached room temperature (26°C).

Fat extraction

Fat was extracted using samples that had been defrosted. Samples were homogenised in a blender and a chloroform:methanol (2:1) extraction was used (Lee *et al*, 1990).

Protein determination

Dried samples, excluding fat and moisture were used and ground in a mortar with a pestle till a fine powder was obtained. An amount of 0.1mg was weighed off per animal and inserted into a foil wrap designed for the Leeko protein analyser. The protein was determined as Nitrogen, which was multiplied by 6.25 to determine the protein concentration in the sample.

Moisture determination

Standard procedures were used in the determination of moisture content of the sample. 2.5g of wet sample was desiccated in an oven at 100°C for twelve hours. The dried sample was weighed and the moisture content determined (AOAC, 1990)

Results and discussion

It was noted that the carcasses of seal pups dress out to very low percentages (49%) compared to the carcasses of other species such as cattle, sheep and pigs. The dress out percentage in this case, includes the head as well as the flippers. All viscera is removed as well as the hide. This is because at present, the whole carcass is used for the production of carcass meal, and no particular cuts are required. If one were to remove the head and flippers as is done with other seal species, this value would decrease even more. It can bee seen from the dressing that most of the energy taken in with their diet goes towards insulation in the form of a thick, snow-white layer of blubber which covers most of the underneath of the tail. In the bulls, these dress-out percentages would be higher as more muscle has been formed in order to move around in the search of food. As the pups were at the point of weaning, none of them would have had to dive deep or swim far to find a source of food, therefore, their bodies had not had time to get accustomed to maintaining high levels of oxygen in their muscles. This was clear to see from the light colour of their meat compared to the dark red colour of the meat of the adult animals. Their staple diet had consisted of milk till then, and thus no other food sources, *e.g.* fish, would have been consumed to affect the colour or flavour of the blubber or meat.

Meat samples were taken from the *Pectoralis* muscle of freshly culled carcasses of ten cape fur seal pups and ten cape fur seal bulls. Blubber samples were taken from the same animals. All pups were approximately eight months of age, whilst the bulls were between two and four years old. As seen in Table 1, the meat of the pups contained a higher percentage fat (4.2g/100g) than that of the bulls (2.4g/100g), but a very similar percentage of protein (23.2g/100g). The blubber samples of the bulls contained a higher percentage of protein (26.6g/100g) than that of the pups (14.6g/100g) but a lower fat percentage (67.1g/100g) than that of the pups (77.2g/100g). Seal meat could therefore be considered as a healthy food commodity due to its lean meat content with most of the fat being blubber and thus stored sub-cutaneously. The moisture content of both the meat as well as the blubber of pups as well as bulls is very similar.

Table 1. Mean values of the chemical composition of the meat and blubber of 10 Cape fur seal pups and 10 Cape fur seal bulls.

	Meat			Blubber		
	Moisture%	Protein %	Fat %	Moisture%	Protein %	Fat %
PUPS	73.0±1.6	23.2±1.5	4.2±1.7	8.0±1.9	14.6±3.0	77.2±1.9
BULLS	74.2±1.6	23.5±1.5	2.4±0.8	5.9±1.6	26.6±4.3	67.±5

Conclusions

Countries with concessions to harvest seals, in this case Namibia, could benefit from full utilisation of the animal. The chemical composition of the meat shows that it is lean meat with a very high protein content and that most of the blubber lies subcutaneously, as in pork. This makes it nutrient dense meat for the consumer to use as an alternative source of red meat.

References

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