

Selection of Knives

Slaughtering Operations

Choice of Knife

Knives are used as an essential part of the slaughter and dressing process in the cutting and preparation of raw meat for wholesale and retail sale, and in the manufacture of meat products. They are used to slice cooked meat products and in the preparation of the by-products of slaughter, plus many other more mundane tasks throughout the red meat and poultry industries.

Looking at the range of activities which involve knife usage and the different cutting operations which require major modifications to the pattern of the knife, we have the following categories of operation: -

Slaughtering Operations

1. Bleeding
2. De-hairing/penning operations
3. Flaying/skinning

Cutting, Boning and Trimming Operations

4. Cutting/size reduction/portioning
5. Boning and trimming
6. Scoring/general cutting operations
7. Opening packages/boxes/sacks

The following text takes each of these operations and examines what is required from the knife in the performance of each specialist operation.

The following chart gives an overview of the use of knives in the different sectors of the meat and poultry industry.

Slaughter

- Bleeding
- De-hairing
- Flaying/skinning
- Evisceration
- Offal trimming
- By-products preparation
- Meat inspection

Wholesale

- Quartering beef
- Primal cutting
- Boning
- Trimming

Retail

- Primal cutting
- Secondary butchery
 - Boning
 - Trimming
 - Rolling
 - Portioning
 - Size reduction
 - Scoring

Manufacturing

- Primal cutting
- Boning
- Trimming
- Size reduction
- Rolling
- Ingredient preparation/portioning

General

- Opening packages/boxes/sacks
- General cutting operations

Slaughtering Operations

Bleeding

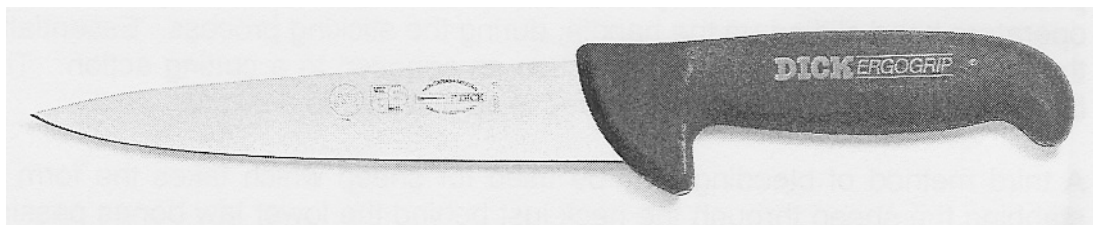
Animals are bled as an essential part of the slaughter operation, both to complete the act of slaughter and to drain the blood from the resulting carcass enhancing its attraction to the consumer, also improving its keeping qualities.

Bleeding is carried out by cutting the jugular veins and the carotid arteries. This can be done by means of a transverse cut through the tissues of the throat almost down to the bones of the neck. It can also be done by inserting the point of a knife into the centre of the throat a few inches from the arch of the first ribs.

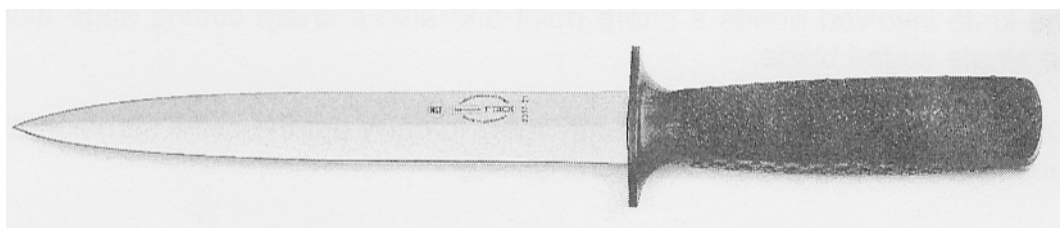
The knife point is pushed forward until the point penetrates the confluence of the anterior vena cava with the jugular veins and lying beneath it, the confluence of the anterior aorta and the carotid arteries. Care must be taken not to penetrate the pleura, which is the membrane that seals the entrance to the chest cavity of the animal.

Such are the essential actions of the bleeding operation, when using a knife, to carry out these two distinctly different operations both achieving the same end, the bleeding of the animal.

Because of the different methods adopted in the process, a different type of knife is needed for each method.



Single edged sticking knife



Double edged sticking knife

Method one, the transverse cutting of the neck and its major blood vessels, requires a knife that is long enough to cut across the throat in one single action, with a fine edge that will sever the tissues of the neck cleanly and quickly. Weight is not required in the knife, but the blade must be rigid and inflexible in order that the cut will be smooth and straight.

There is no need for a point on the knife and a square ended blade is essentially suitable for the task.

The best example of a knife that meets all these criteria is the knife used in Schechita, the Jewish Ritual Slaughter process - the halaf.

Where bleeding takes place by the sticking process, the point of the knife is all important, especially in the case of pigs, which are often immersed in the scalding tank after slaughter. Here it is imperative that the incision through the skin is as small as possible to minimise contamination. The blade of the knife must be sufficient in length for the point of the knife to easily reach its target but not make the knife unwieldy. The upward stabbing action and subsequent movement of the knife tip to penetrate the vessels must be able to be controlled with great precision by the operator, otherwise problems are incurred.

Often a knife with a double edged blade is used to aid penetration through the skin and tissues of the neck.

The accent on knife usage in this case is the use of the point which needs to be needle sharp with an effective cutting edge on either side of the tip to enable cutting of the vessels easily when the knife tip is moved within the penetrated vessels. Usually the knife has a guard which prevents the operators hand sliding up the handle, during the sticking process. Essentially, the knife is used with a stabbing action as apposed to a cutting action. The best way to compare these two knives is as a stiletto to a sword.

A third method of bleeding may be used for sheep which takes the form of stabbing the sheep through the neck just behind the lower jaw bones passing the point of the knife through from one side of the neck to the other and then cutting back towards the vertebrae thus cutting both the carotid arteries and the jugular veins. This is usually done when the sheep is laying on a cradle. The knife involved needs a sharp point and also a sharp cutting edge along the single edged blade.

It needs to be short and easily controllable to carry out the initial stabbing and subsequent cutting action neatly and quickly.

De-hairing/Penning Operations

After bleeding pigs are usually scalded and de-haired. Today this is usually a machine process but whether carried out by machine or manually there is often a need to finish off the process by a further shaving off of residual bristles, using a knife.

The essential features of this activity, which often involves some dressing work on the carcass, is to ensure the skin is not slashed, the hair/bristles are shaved off cleanly and efficiently and quickly. Often the bung end is freed, the penis removed on male pigs and the aitch bones split.

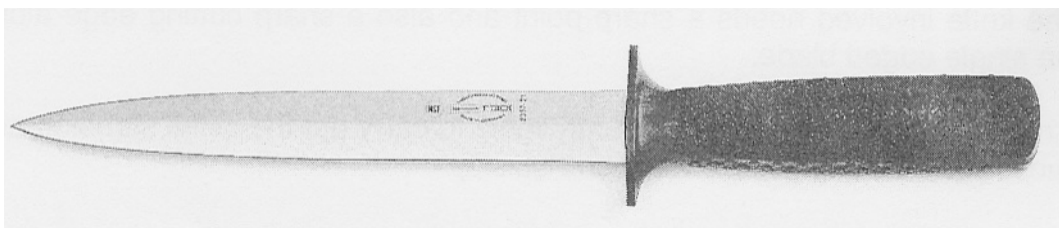
The type of knife most suitable for this purpose is a medium weight, wide bladed, medium length knife about 20-23cms (8"-9").



Depilating knife

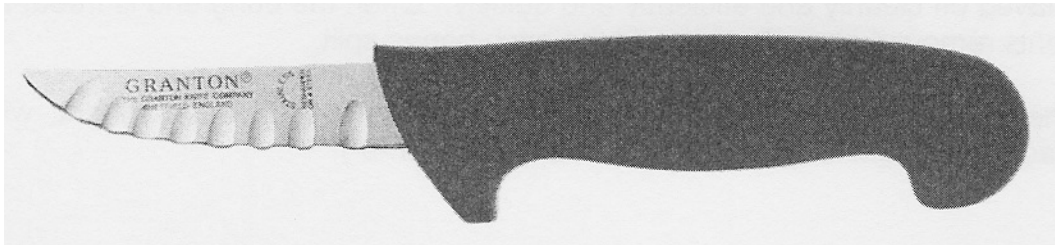
The blade must be razor sharp to shave the hairs off the pig and there must be a suitable point which enables the tip of the knife to be easily inserted into the pelvic cavity to cut around the bung.

Penning poultry is an operation that is not a necessary part of production operations in poultry slaughter and dressing today but where such an activity is required a small knife with a broad blade in comparison to its size is the ideal. The knife, in this case, is used as one half of a pair of tweezers, the operator's thumb acting as the flexible other half. The knife does not need to be razor sharp and, in fact, is less functional if this is the case, because it tends to chop off the pens rather than be effective in pulling them out with the aid of the thumb.

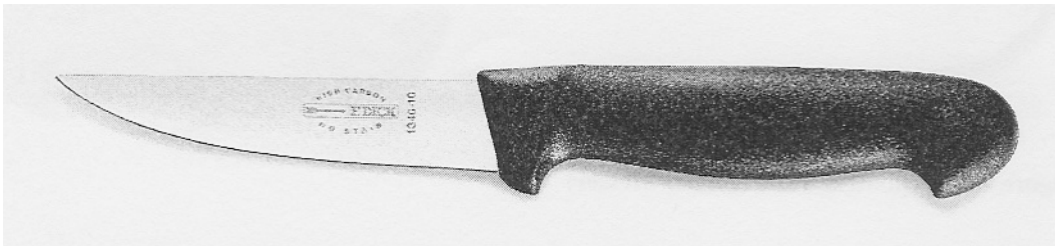


Double edged sticking knife

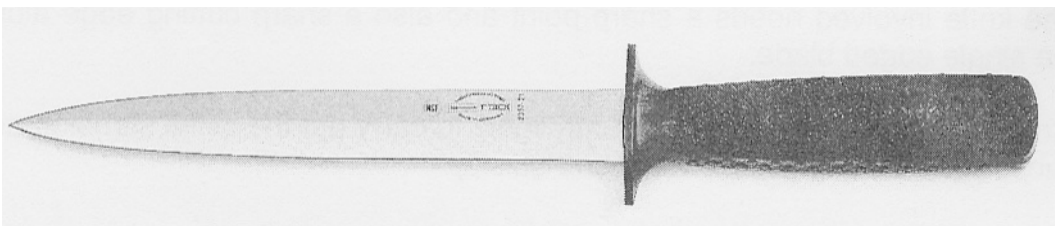
The blade of the knife is placed on one side of the pen and the thumb pushes the pen against the blade so the pen is effectively gripped between thumb and blade. A twist of the wrist in a clockwise direction and the pen is pulled out of the skin. No cutting action is required hence the lack of need for a sharp edge which might in fact contribute to damaging the skin of the bird.



Granton edged poultry knife



Poultry knife

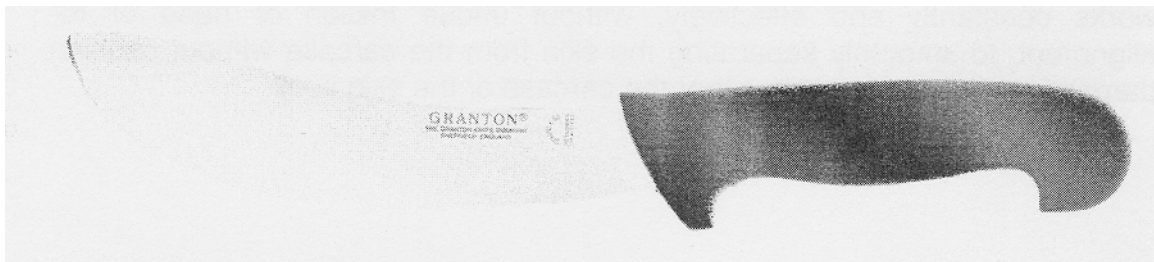


Double edged sticking knife

Flaying/Skinning Knives

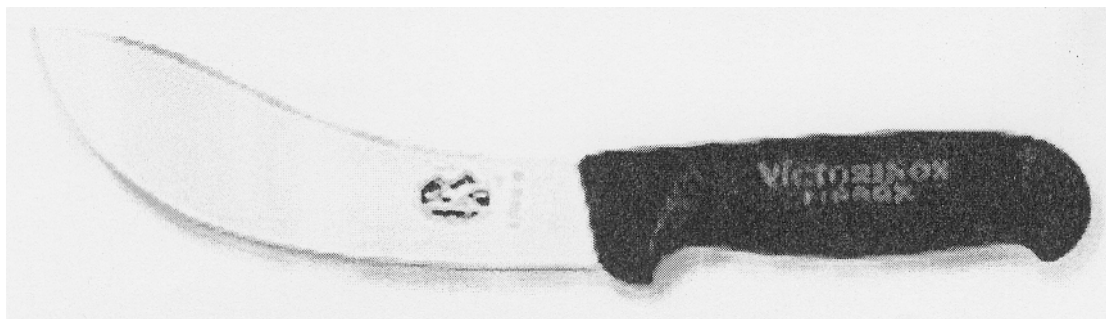
The flaying or skinning of the animal is an essential part of the slaughter operation, especially where the slaughter operation is carried out manually, rather than involving complex machinery. There are two distinct functions in the removal of the skin. One the legging operation, where the hide or skin is removed from the fore and hind legs of the animal, the buttocks and the shoulders. Two, the siding and backing down operation, where the hide/skin is removed from the belly flanks and back of the animal, to clear it eventually from the rest of the carcase.

These operations, although both involve the removal of the hide or skin vary in the nature of the skills required from the knife user and also in the requirements of the knife itself. In both types of flaying or skinning operations the most essential requirement from the knife is a razor-sharp edge which is fine and smooth and free from indentations. When the knife is used properly it should never be brought into contact with any bone or other hard material or surface that might fracture its edge or blunt it. Where there is a need for the slaughter-man to carry out an action that involves breaking joints or splitting bones such as the aitch bones or breast bones the slaughter-man usually uses a back-up knife, sharpened to an edge that allows ease of cutting in such operations but is not too fine to break up in use.



Skinning/Siding knife

When carrying out legging operations the knife usually preferred is a slimmer version of the normal flaying/skinning knife with the same degree of curvature at the front of the knife but with a defined point that allows easy initial penetration of the skin and the making of the ripping cut along the inside of the legs and shoulders.



Lamb skinning knife

Such a shape also makes for the easier carrying out of the ancillary activities such as breast removal and the freeing of lungs and the oesophagus. Being slimmer, the knife is easier to manipulate especially on small animals, but the curvature on the blade is still essential to prevent the knife digging into the skin continuously, possibly causing nicks in the skin and certainly hindering free movement of the knife and easy freeing of the skin from the carcass.

Knives of this type may be purchased from knife manufacturers but often are broad bladed skinning knives that have been worn down over time through constant sharpening and use.

The knife used for siding or backing down, especially with cattle, is a broad bladed knife with a definite bulbous end at the front of the blade. It has no defined point and the blade should have a razor edge to the tip of the blade, especially along the blade's curvature. This allows for the movement required in the action of separating the skin from the subcutaneous tissue. This movement is essentially a drawing of the knife down between the skin and the underlying tissue to sever the fine web-like connections that link the skin to the carcass. The knife is drawn down between skin and the carcass, first, by the action of the forearm moving downwards from its pivot, the elbow, and subsequently the operator's wrist, following the same downward path pivoting from the wrist. This movement ensures the curvature of the blade of the knife works constantly and effectively, without undue friction or need of re-alignment, to smoothly separate the skin from the carcass without causing damage or disfigurement to either the carcass or the skin itself.

Knife Usage Overview

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- Bleeding
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- Evisceration
- Offal trimming
- By-products preparation
- Meat inspection

Wholesale

- Quartering beef
- Primal cutting
- Boning
- Trimming

Retail

- Primal cutting
- Secondary butchery
 - Boning
 - Trimming
 - Rolling
 - Portioning
 - Size reduction
 - Scoring

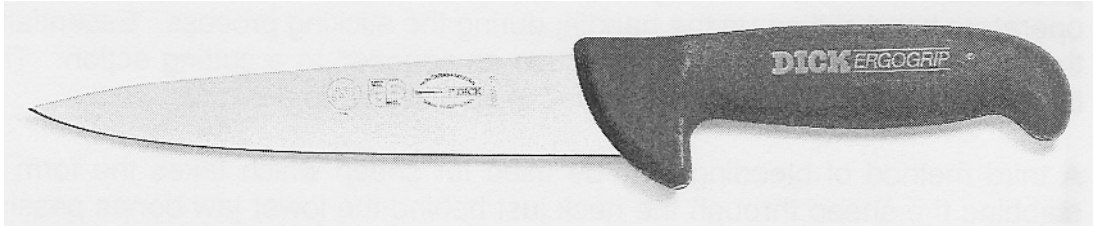
Manufacturing

- Primal cutting
- Boning
- Trimming
- Size reduction
- Rolling
- Ingredient preparation/portioning

General

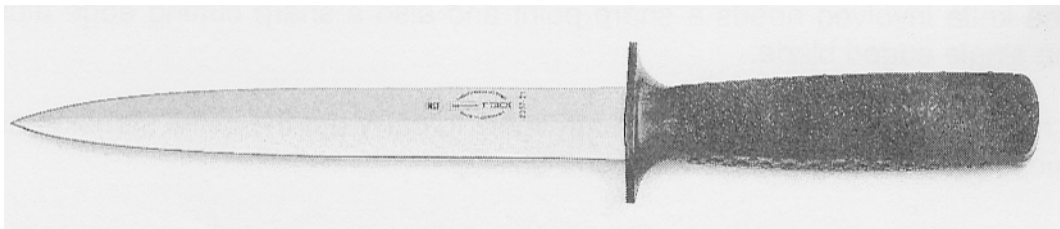
- Opening packages/boxes/sacks
- General cutting operations

Sticking Knives



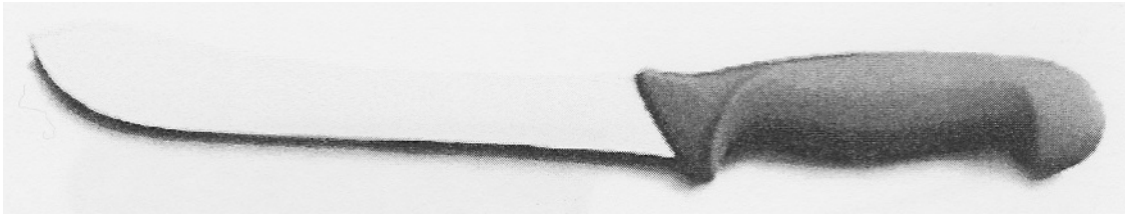
Single edge sticking knife

Strongly defined points
Double edged point in some cases
Well defined guards at the hilt



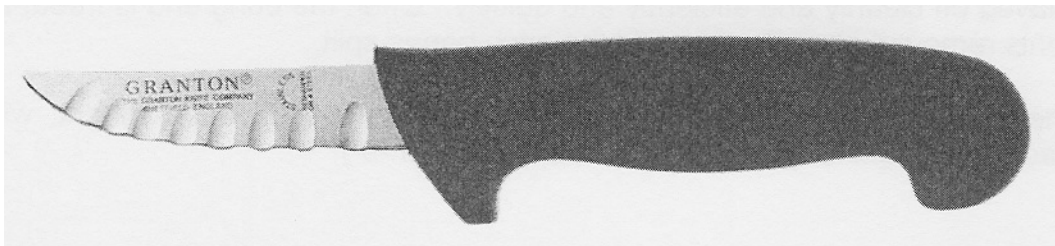
Double edged sticking knife

Dehairing Knife

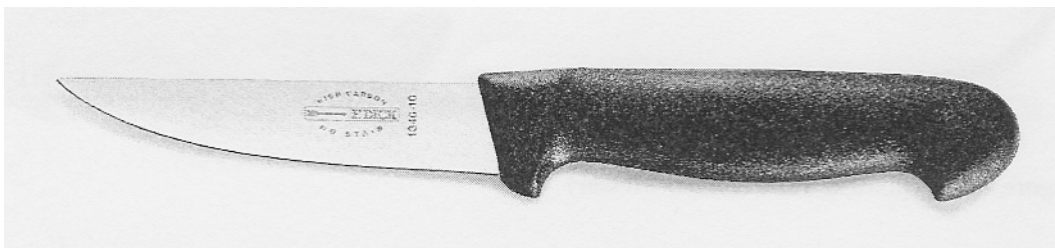


Depilating knife

Curved tip of blade
20cm to 23 cm in length

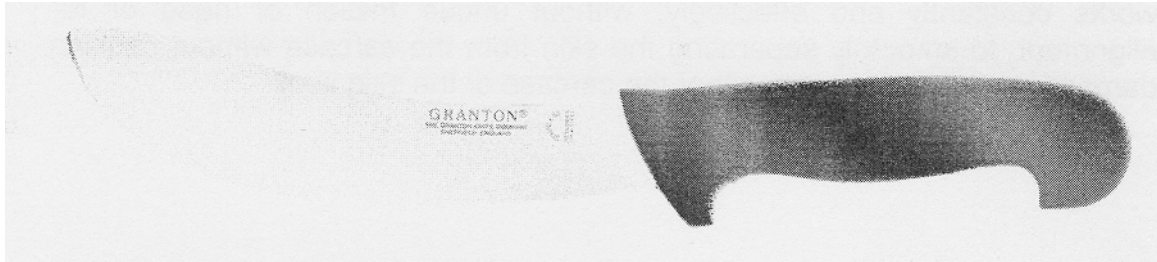


Granton edged poultry knife



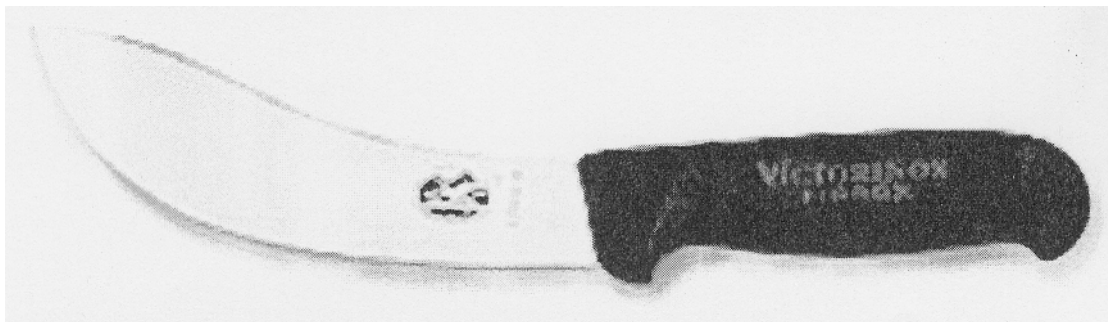
Poultry knife

Flaying Knives



Skinning/Sliding knife

Broad bladed knife
Curved bulbous tip



Lamb Skinning knife