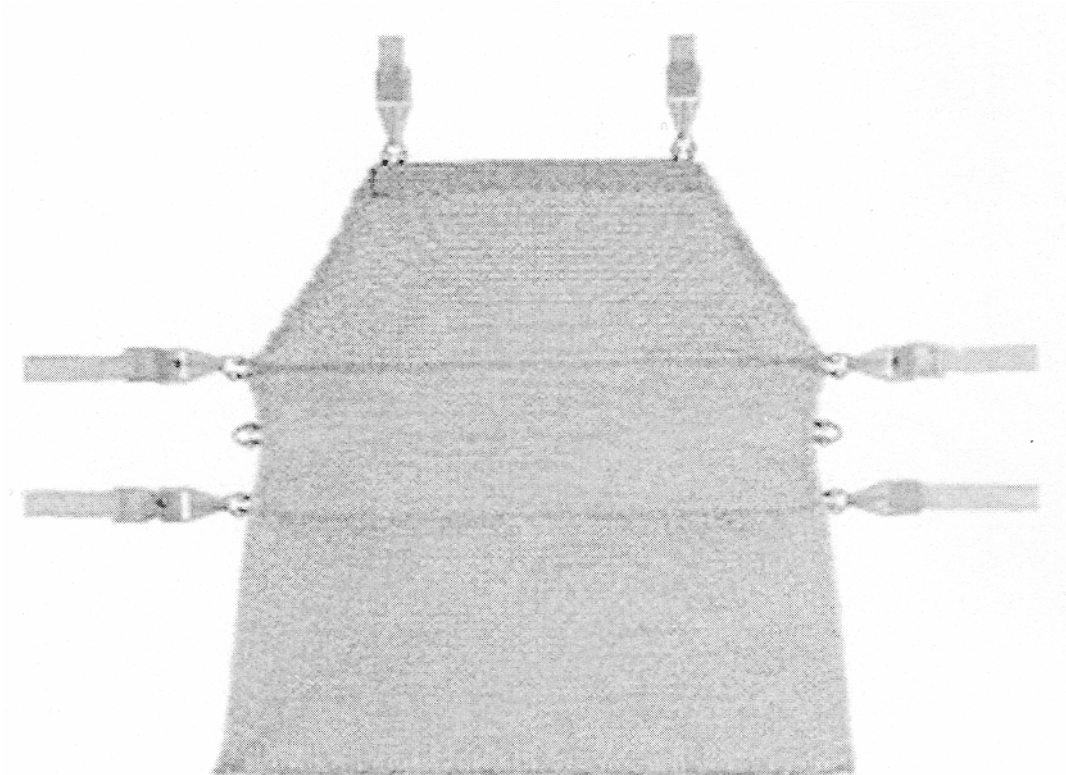


Knife Safety and Hygiene

Personal Protective Equipment (PPE)

Aprons

Suitable protective aprons, usually chain mail or overlapping metal discs, must be worn during all deboning work or during other work where the knife is pulled with the point towards the body. The only exception is where a fully trained butcher is principally engaged in serving customers. Aprons should always be worn by butchers undergoing training in deboning work or other knife work where the knife is pulled with the point towards the body.



Metal mesh apron

The apron should cover the body area from mid-breast bone to mid-thigh. The weight should be borne by the wearer's shoulder and not their neck/ The apron should be fully adjustable with shoulder straps and waist/hip belts so that it sits neatly against the body. The bib should not sag when the wearer bends forward.

Aprons should be properly maintained. Loose or missing links or discs should be replaced immediately and straps and fastenings should be kept in good condition.

"Stab pads" made of Salata belting or similar material are not suitable as protection against stabbing injuries.

Aprons should comply with the penetration test set out in British Standard BS 7185 1-989 "Protective Aprons for use with Hand Knives".

Apron and Leggings

An apron with the lower half divided to form knee-length leggings secured to each leg by straps should be worn by persons in abattoirs engaged in "legging out" (skinning of the leg) which involves holding the leg of the car case between the thighs and drawing the knife towards oneself along the carcass shin bone. The danger is of stabbing, particularly in the thigh or abdomen.

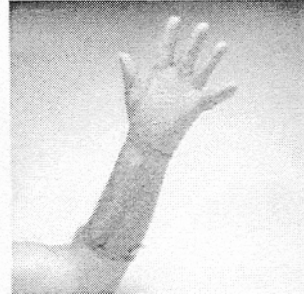
Gloves

A suitable protective glove providing 3 or 5 digit protection, usually chain mail or overlapping metal discs, should be worn on the non-knife hand during deboning work.

Protective gloves are also recommended for other hand knife operations particularly when an operator is inexperienced or under training.



Mesh Glove



Mesh Gauntlet

Forearm Protectors

Some gloves are designed to give wrist and forearm protection but forearm protectors made of clear plastic and either attached to or independent of the gloves can also be obtained.



Mesh Glove

Other Protective Clothing

In some situations, such as slaughterhouses and wholesale meat depots etc, where there is a hazard from overhead carriers or low rails, there is a need to protect the head and neck from the risk of injury. The usual type of headgear in these situations is a bump helmet made of impact resistant material that will protect the wearer and is capable of being effectively cleaned.

In all situations in the meat industry there is a risk of injury from falling edged hand tools. It is necessary that all staff involved in production operations should wear strong shoes, preferably specialist safety footwear with steel toe caps. In the slaughter-house and other situations where hygiene is of paramount importance Wellington boots must be worn but these should be specialist safety types of boot. In all cases it is imperative that footwear should have non-slip soles and be comfortable so as not to create foot problems.

In factory and slaughterhouse situations there is often a noise problem from the high powered machinery in use there. Where noise levels are such that they may be a hazard to health protective ear-muffs or plugs should be worn.

Protective Clothing Code of Practice

Protective aprons should always be worn during deboning operations or other work where the tip of the knife points towards the body.

Protective aprons must be the correct size. The protective surface should extend from mid breast bone to mid thigh.

The protective apron must be properly adjusted so that it fits neatly against the body.

Protective gloves must be worn when deboning and where necessary, for other knife work as well.

The glove must be the correct size.

Any defects in protective clothing must be reported to the supervisor immediately.

Keep protective clothing (including gloves) clean.

Factors Influencing the Effective Use of Protective Clothing

The need for the wearing of chain-mail personal protective equipment on the non-dominant arm/hand in boning and trimming operations is dependant on the following factors: -

- the speed demanded by set targets or process line flow
- the position of the meat in relation to the operative
- the nature of the boning, cutting, trimming operation
- the knife actions required
- the position of the arm in relation to the knife point and/or blade at the termination of the cut
- people working in close proximity

Above are listed the non-operative influenced considerations involved in the wearing of chain-mail gloves and gauntlets, but there are considerations that must be taken into account that are influenced by individual operatives, these being: -

- levels of skill, experience, training
- concentration levels
- working methods involving use of the knife

Taking each of the points in turn, the general situation is:-

Speed Demanded by Set Targets or Process Line-Flow

The more time an individual has to carry out cutting/boning/trimming operation, the easier it is to follow good knife usage practice i.e. cutting away from ones hand or body, ensuring the meat being processed is always in the safest position for the particular operation, having a stable, unmoving meat product to work on - especially on conveyerised systems.

Increasing speed means that often the product is moving in relation to the operator, is received in an unsuitable position, and the time is not taken to position it properly.

Flamboyant knife practices become the norm, with exaggerated follow-throughs, bringing the knife point and blade in close proximity to areas of the body with which it should not normally be in contact. Good knife usage practices are forgotten.

Once a person begins to wear chain-mail on the non-dominant arm, there is a tendency to develop an "I can't be cut" mentality and individuals naturally increase their speed with this in their minds, good knife usage practices being totally forgotten. As their knife usage becomes more exaggerated, the knife point and blade reaches areas once not at risk.

The result is a need for more and more protection along the arm.

The Position of the Meat in Relation to the Operative

The lower the position of the meat in relation to the height of the operation means greater risk to the higher regions of the arm.

Conversely, the higher the meat in relation to the position of the operator, especially on carcass meat suspension, boning/cutting and trimming operations, the greater the upper arms, shoulders and even face is at risk!

Bad practices which develop during the working situation, such as bending too far over the meat, brings the upper arm, shoulders, and face even, again into a risk situation.

Obviously, different heights of operatives alters the possible risk to various regions of the arm.

The Nature of the Boning, Cutting, Trimming Operation

Slicing operations involve the knife being inclined downwards with the blade down and the point descending and not rising.

At the end of each slice the blade is brought to a stop by the cutting surface on which the meat is placed. Thus, only the finger tips should be at risk and at the most, the hand to the wrist, therefore a glove should be more than sufficient for such operations.

In such operations, cuts above the wrist, usually would show negligence or gross misuse of the knife.

A boning operation where the portions of meat are small and easy to handle at bench level, with plenty of time available to the operative, would only need a chain-mail glove because the work involved is nearly all point-of-the-knife work, and sensible knife control should not bring the knife in contact with the arm above the wrist.

Factors that might negate the last statement are:-

- Increased speed in the boning operation
- Meat in the wrong position for the work involved
- Operative bending low over the meat (it has been known for the knife point to flick off and cut a person's eyelid in such a situation- but this is very, very poor operating procedure).

A boning operation dealing with large bones, especially at speed needs, at the very least, a chain-mail gauntlet on the non-dominant hand because there is a far greater danger of the knife point following through due to the greater use of the blade of the knife in such operation - this leaves more of the blade of knife to the point to slide or

flick off the bone or be carried through by the dominant hand towards the non-dominant fore-arm.

The greater the speed involved and the more awkward the position of the bones the greater the need for upper arm protection as well.

In suspended carcass meat boning, trimming and cutting operations, upper arm protection is the very minimal acceptable.

Where cuts have to be made following a horizontal plane, on suspended carcasses with the operative possibly closely involved in the holding of the carcass steady, full arm and shoulder protection is definitely required.

Where there is any cutting operation that brings the knife in direct alignment with the body and the cut starts away from the body and moves into the body, chain-mail protection should always be provided. Often, even though it is expected, the operator will cut away from themselves, operative cut towards themselves for better alignment of the cut and ease.

The Nature of the Knife Actions Required

Knife actions required in meat cutting plants can be divided into the following categories:-

Boning actions

Where the knife is held firmly within the closed fist, holding the knife in a "stabbing" position, blade vertically pointing downwards.

Slicing actions

Where the knife is held with the thumb on top of the handle of the knife the blade at a 90° angle to the cutting surface and the point of the knife directly in front of the operative, as a continuous extension of the hand and arm.

Trimming actions

Where the knife is held more loosely in the palm, the blade nearly parallel to the cutting surface, the edge of the knife facing and at approximately a 90° angle to the operative's body. In this action most of the "cutting" is towards the operative's body, not away from it and the operative constantly alters the position of the knife relative to the hand, the meat and the body.

Use of the knife in the "boning action" position on small pieces of meat in a static bench position should provide no risk to the operative wearing a gauntlet.

Use of the knife in the "Boning" position on large pieces of meat or meat in awkward positions, especially suspended carcass meat, should need upper-arm and possible shoulder protection.

Use of the knife in the "slicing" position should only need hand protection- a glove.

Use of the knife in "trimming action" position on small cuts of meat in static bench position should only need a gauntlet on the non-dominant arm.

Use of the knife in "trimming action" positions on large cuts of meat and suspended carcass meat operations would definitely require shoulder and upper arm protection.

The Position of the Arm in Relation to the Knife Point and/or Blade at the Termination of the Cut.

This is considerably influenced by the operative and the operative's method of working.

Some operatives work very economically and are very precise in their use of the knife and knife actions they employ which means they create very little follow-through of the knife point and/or blade and very little exaggeration of knife movement. They are usually the ones who have the least accidents.

Other operatives are showy and flashy and deliberately exaggerate their follow-through of the knife and the movements of the knife. These are the ones that tend to be most at risk.

Training does not necessarily reduce this situation. Those people who are natural show-offs and performers constantly perform for the gallery, including their workmates around them. Such people are often a danger to themselves and others.

The position of the meat in relation to the operation is a second factor in the determination of the knife point and/or blade in relationship to the termination of the cut.

The further the operative has to stretch forward and over the meat, the greater the danger of extended follow-through with the knife resulting in the need for more upper arm and/or shoulder protection.

People Working in Close Proximity

Whilst on the subject of protection for operatives on boning tasks, it is important to remember the risks to other people from the original knife user should they be working closely together and consideration should be given to the position of each person in the line or in the working

situation to ensure there is no risk to any individual from the knife usage activities of others. This may mean providing special chain-mail protection.

Factors that also affect knife usage that are influenced by the individual operator need to be considered in detail.

Levels of Skill, Experience, Training

Those that have suffered the experience of bad cuts certainly take extra care when using the knife and they are very mindful of the fact, they do not have a repeat experience.

The young and the inexperienced knife worker, should always be additionally protected beyond normal minimum requirements.

The greater the level of skill in the use of the knife then the less the risk to the user. This emphasises the need for effective training in the safe and sensible use of the knife.

Training in knife usage must be visibly thorough and it would be useful to have some form of competence-based test before the operative was exposed to line speed operations.

Concentration Levels

When using a knife, concentration is vital, as it is in all operations where there is a constant potential hazard accompanying a high risk factor.

Concentration can be affected by: -

- the environment
- interruptions
- horse-play
- boredom
- repetitive nature of the task

Knife users in the meat industry tend to be employed on the same operation for the full period of the shift with only the standard regulatory breaks. Consideration should be given to whether this is a contributory factor to high accident levels.

A factor which should also be considered is that knife users work on a very cold product in a cold environment. This may affect the degree of dexterity they are able to exhibit throughout the period of a shift.

Working Methods Involving the Use of the Knife

Static bench-based boning/cutting and trimming operations with no time pressure has had a long history of limited major cuts, these always being caused by lapses of concentration, a sudden increase in pressure put on the operative by circumstances, or carelessness.

The use of a chain-mail glove in this type of operation is more than sufficient to prevent accidents.

Pork/lamb bench-based boning/cutting and trimming operations involving set production targets, therefore putting pressure on operatives to increase their speed, needs more personal protective equipment to protect operatives from speed-related poor practice in knife usage, therefore a minimum requirement would be a gauntlet.

Conveyor-based boning/cutting/trimming operations, especially with beef, should have as a minimum, upper arm protection.

In suspended carcase boning/cutting/trimming operations, operatives should be provided with shoulder protection especially those working at shoulder height or above.

Conclusion

Personal Protective Equipment in the form of chain-mail is always considered to be the ultimate in the prevention of accidents, where knife usage is involved, but it must be remembered that such equipment is restrictive and weighty, and when worn over an 8 or 12 hour shift, i.e. an extra burden to the operative - consideration might be given to: -

- Better environment
- Improved training
- Improved work situation
- Slower line speeds
- Staff job rotation
- More break periods

All of the above cost money but they also have benefits in the improvement of quality as well as reducing the payments made to staff in lieu of liability for industrial injuries.

Safe Use of Knives

Some people feel safer with dull knives than sharp ones.

Nothing could be further from the truth. A dull blade must be used with more brute strength and less control than with a sharp one. More accidents happen with dull knives than with sharp knives. If an accident should happen, a sharp blade will make a clean cut. A dull knife may not cut as deep, but it will be more painful and take much longer to heal because of the ragged edges.

Hazards

Hand knives cause a large number of accidents in the meat industry.

The accidents usually involve cuts or stabs to the non-knife hand and forearm but stabbing injuries to the body cause very serious injury and there have been fatalities.

Most of the fatalities and serious injuries happen during deboning operations. For this work meat is held down on the block or table and moved with one hand, while the knife is gripped firmly in the other hand, blade downward. The knife is extremely sharp and is pulled through the meat towards the body. Accidents happen when the knife slips off the bone and stab the operator.

Other work involving knives includes cutting, slicing, dicing, skinning etc. The risk to the body is not as great during these operations because the knife is pushed down towards the work surface rather than drawn towards the body. However, there is still a risk of cuts and stabs particularly to the non-knife hand and forearm.

Serious facial injuries including loss of sight have occurred when knives have been used to handle meat and when the knife has been kept in the hand while handling other items such as trays or boxes.

Precautions

Select the right knife for the task. Deboning knives normally have a plastic handle that is designed to prevent fingers slipping onto the blade.

For sticking or operations involving pushing movements of the knife, the handle should have a suitable cross-guard. The knife should be comfortable to grip and it should have raised portions at the junctions of the handle and the blade to minimise the possibility of the knife hand sliding over the blade.

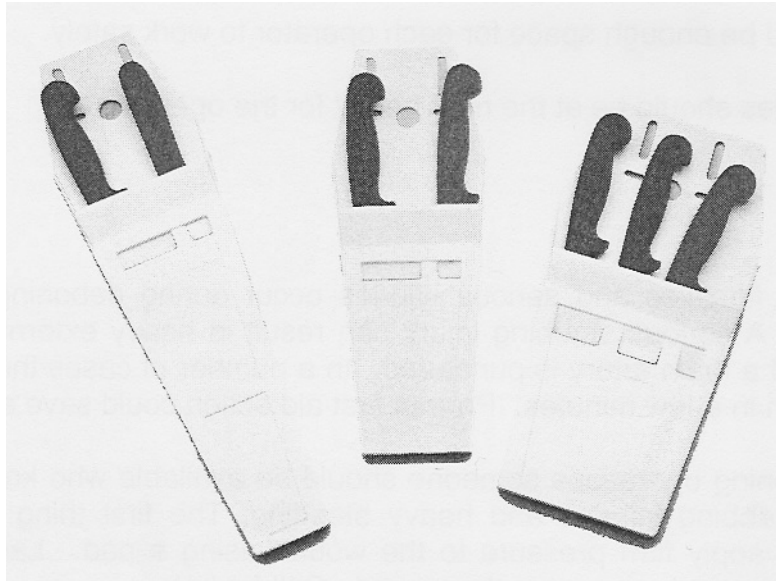
Knives should not be used when sharpening has reduced them to thin narrow blades that can pass through protective aprons or snap under pressure.

Steels with handle guards large enough to prevent cuts should be provided.

Safe Storage of Knives

Knife racks or other storage facilities should be provided, next to the work station. Scabbards should be provided if workers need to move around the workplace with knives. The scabbards should be divided into compartments and be easily dismantled for cleaning.

When not in use, knives must never be left lying around.



Scabbards

Training

All new employees must be given a thorough basic grounding in the use, care and maintenance of knives and other equipment including steels and scabbards. It is important to check whether a person is right or left handed before commencing instruction.

All new employees must also be given a thorough grounding in the dangers associated with misuse of knives.

The use and maintenance of protective aprons, gloves and trousers should also be explained and attention would be drawn to the employee's obligation to wear such protective equipment.

Instruction should be given either by the foreman or an authorised training instructor. Whoever carries out the training must be satisfied that the employee has understood and absorbed all information supplied. The training should include grinding and steeling to full proficiency. Newly trained staff must be introduced gradually to full speed production. They must be carefully supervised until sufficiently skilled to work with safety at full production rates.

Workplace

Working areas must be clean and tidy. Working surfaces and surrounding floor areas in particular should be free of debris and production waste. Floors should be slip resistant.

Lighting levels should be sufficient to ensure good visibility. (540 lux minimum).

There should be enough space for each operator to work safely.

Working tables should be at the right height for the operator.

First Aid

Most of the fatalities and serious injuries occur during deboning or similar operations. A serious stabbing injury can result in heavy external bleeding, particularly if a main artery is punctured. In a number of cases the victim has bled to death in a few minutes. Prompt first aid action could save a life.

During deboning operations someone should be available who knows how to deal with stabbing injuries and heavy bleeding. The first thing to do is to immediately apply firm pressure to the wound using a pad. Lay the victim down while continuing to press the wound. Call for help.

Knife Hygiene

The knife is generally accepted as a suitable vehicle for the carriage of microbial contaminants such as food poisoning bacteria from one product to another, thus causing cross-contamination. This is especially a concern in situations where knives may be used on raw meat and poultry products and then, without cleaning or sterilization taking place, be used on cooked and ready-to-eat products, where there are no safety factors such as further heat treatment, which might destroy micro-organisms present on the product. In the slaughterhouse, although operatives are only dealing with carcasses and raw meat, there is considerable danger from microbial cross-contamination by knives from gut contents, the hide and skin of animals and from lesions of disease that may be present on carcasses undergoing slaughter which could be teeming with pathogenic bacteria. It is essential that proper cleansing and sterilization of knives takes place according to established company and legislative procedures.

The knife itself can be a source of physical contamination of meat and meat products. Breakage of the blade, while carrying out processing operations, is a significant hazard that can result in subsequent severe consequences for possible consumers. Fragments of metallic chips, dust from sharpening operations, and also oil are possible contaminants, if the knife is not cleaned after it has been sharpened.

When considering knife hygiene, one must also consider the hazard created by improper cleaning and knife care.

A clean handle free from grease is vitally important in the safe and efficient handling of a knife. Where handles are not cleaned properly in detergent and all the grease is not removed, there is a risk of the hand sliding along the handle onto the blade with serious cuts resulting. Greasy handles may cause the knife to slip out of the hand and into the lower limbs with fatal results should the point penetrate an artery as has happened on more than one occasion within the industry.

Cleaning Knives

Knives should all be cleaned individually, they should never be immersed en-masse into water, whether soapy or not, and one should never put ones hands into a container holding a number of knives immersed in water, whether hot or cold.

A suitable cleansing solution should be prepared containing hand hot water and detergent.

If the water is too hot there is always a danger of dropping the knife in the water and the subsequent search may have unpleasant results for the searcher.

Each knife should be scrubbed individually holding the knife by the handle or by the back edge of the blade.

After scrubbing, knives should be rinsed thoroughly and placed to drain in a safe situation until they can be dried, if this is deemed to be necessary - usually only necessary with carbon steel blades.

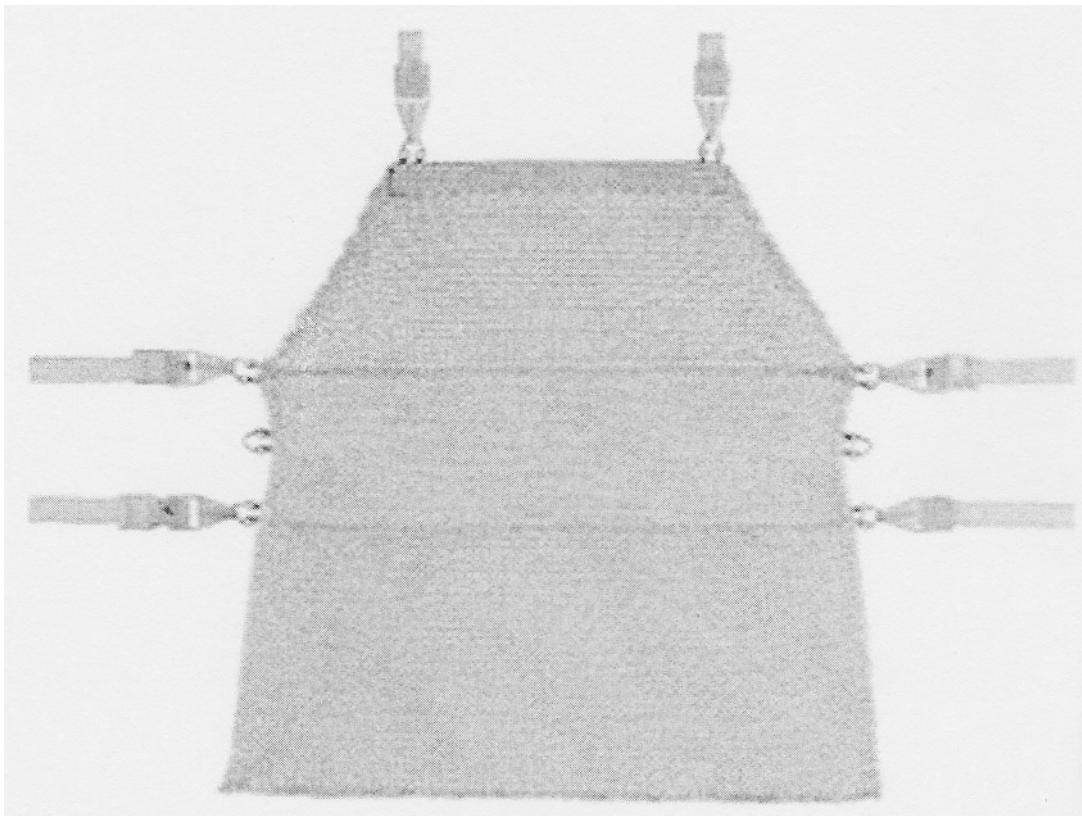
Where sterilizing facilities are in place, knives should be placed in the sterilizer and subjected to the sterilization process for the required amount of time before re-use.

Protective Clothing



Mesh Glove

Mesh Gauntlet



Metal mesh apron

Factors Influencing the Effective Use of Protective Clothing

Non-Operative Influences

the speed demanded by set targets or process line flow

the position of the meat in relation to the operative

the nature of the boning, cutting, trimming operation

the knife actions required

the position of the arm in relation to the knife point and/or blade at the termination of the cut

people working in close proximity

Operative Influences

levels of skill, experience, training

concentration levels

working methods involving use of the knife

Safe Use of Knives

1. Select and match the correct knife for the job. If you have any doubts about which knife to use, check with your supervisor.
2. Check that the handle is shaped so that your hand or fingers do not slip down onto the sharp blade when you reach down to pick it up.
3. Keep the blade edge sharp and always know how sharp your knife is. Never use a blunt knife. This will increase the likelihood of the knife slipping.
4. Do not use a dangerously narrow or thin blade, which can snap or penetrate your protective chain mail.
5. Only use the correct methods for sharpening your knife.
6. Only use a steel that has a hand guard, grip the handle tightly and keep your thumb behind the guard on top of the handle.
7. Keep your hands and knife handle as dry as possible to prevent risk of the knife slipping in your hands.
8. Always replace knives in the scabbards when not in use. Never lay them down on a working surface where they may be covered by other objects
9. Always pick up a knife by the handle
10. Keep the working area as tidy and as dry as possible

Safe Use of Knives

Cont:

11. Make sure you have enough working space - so that you cannot be accidentally jolted and so that no one else is near you if your knife slips.
12. Never wear soft shoes. Keep a pair of non-slip safety/stout shoes for working. Slips and falls with a knife in the hand are potentially lethal
13. Direct the knife away from the body whenever possible. Never cut towards your fingers, hand or an unprotected part of the body
14. Keep all knives, steels and scabbards clean and sterilise them at the end of the working day
15. Never carry a knife in the hand when away from the point of work, unless the blade is covered
16. Never try to catch a falling knife
17. Make full use of protective clothing that is provided, including gloves and aprons.
18. Get first-aid treatment for all cuts, however small. Septic cuts and scratches can be dangerous
19. Never pick up meat with the point of the knife
20. Never carry meat or any other items with the knife in your hand