

**Penang Sangam High School**  
**P.O. Box 44, Rakiraki**  
**Year 12 Agriculture Lesson Notes Week 21**

<b>Strand</b>	<b>AS 12.4 Livestock Production</b>
<b>Sub-Strand</b>	<b>AS 12.4.2: Cattle</b>
<b>Content Learning Outcome</b>	<b>The student will explore, discuss, practice and evaluate livestock concepts and relate them to practices in Fiji.</b>

**Lesson 2: Milking Dairy Cattle**

**Lesson Outcome: At the end of this lesson the student will discuss the milking of cattle.**

Hygiene is important so cows and equipment must be cleaned and inspected daily.

1. **Cleaning** - hygiene keeps milk clean and reduces spread of diseases in milking herd.

- (i) **Udder** - water is sprayed onto udder as animal enters the milking yard to soften dirt on udder
- before animal is milked, dirt is washed off the udder
  - udder is inspected for injuries and pests like ticks
  - udder is dried using paper towel, which is then discarded

- (ii) **Milking parlor** - walls and floors are cleaned after milking to remove dirt that animals leave behind
- good drainage is essential

- (iii) **Milking equipment** - recommended to be made of stainless steel
- to be thoroughly washed after milking and sterilized before next milking begins

- (iv) **Milking hands** - everyone involved to wash their hands with soap and water before cleaning udder
- wear gum boots to protect feet and clean coveralls to protect their clothing

\*\*\*This will reduce spread of diseases between workers and cattle and among cattle.

2. **Stripping** - is the process which is used to determine if milk in each quarter of udder is suitable for consumption.

**2019 – State one reason why dairy farmers strip milk from wet cows.**

- a little milk is removed from each teat into a separate stripping cup
- milk is checked for signs of mastitis such as flakes, clumps of milk, discolored milk etc
- if healthy, the cow can be milked

**2017 – Importance of stripping in the milking process?**

Stripping is also used to remove the last of the milk from the teat once milking is complete. Just as with sheep and goats, there are two methods of milking: hand milking and machine milking.

**Lesson 3: Products of Dairy Farms**

**Lesson Outcome: At the end of this lesson the student will discuss the products of dairy farms.**

The main product from dairy farms is raw milk.

The average composition of cow's milk is:

- ❖ 87.2% water
- ❖ 4.9% lactose (carbohydrates)
- ❖ 3.7% milk fat
- ❖ 3.5% protein
- ❖ 0.7% ash (minerals)

This milk may be used to produce pasteurized milk, yogurt, curd, whey, cheese, cream, butter, buttermilk and ghee.

Yogurt - a semisolid food prepared from milk fermented by added bacteria, often sweetened and flavored.

Whey - the watery part of milk that remains after the formation of curds.

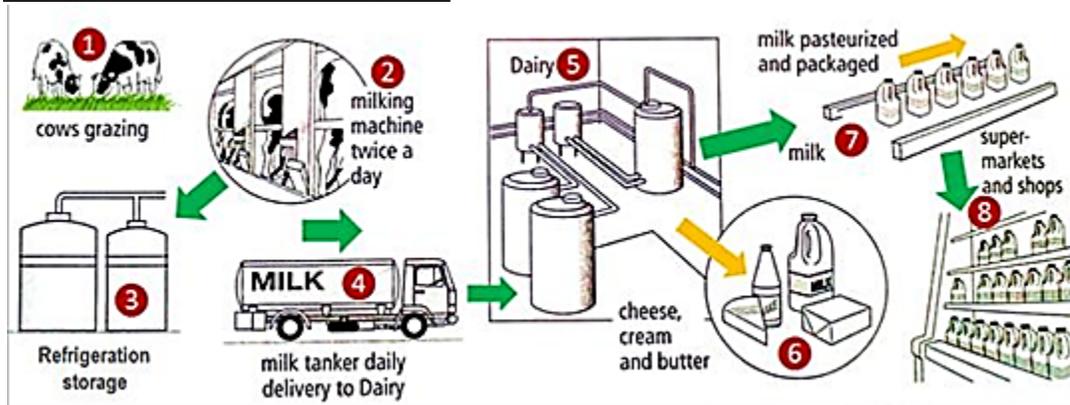
Cheese - a food made from the pressed curds of milk. 2019 – MC No. 19

Cream - the yellowish fatty component of un-homogenized milk that tends to accumulate at the surface.

Buttermilk - slightly sour liquid left after butter has been churned, used in baking or consumed as a drink.

Ghee - clarified butter made from milk of a buffalo or cow, used in Indian cooking.

**The Production of Pasteurized Milk**



**Lesson 4: Slaughtering & Post Harvest Treatment of Cattle**

**Lesson Outcome: At the end of this lesson the student will discuss the slaughtering of cattle.**

There are several criteria for a good slaughter method:

- ✓ animals must not be treated cruelly
- ✓ animals must not be unnecessarily stressed
- ✓ exsanguination must be as rapid and as complete as possible
- ✓ damage to the carcass must be minimal
- ✓ method of slaughter must be hygienic, economical and safe for abattoir workers

Lairage - a place where sheep or cattle may be rested during transit to a market or abattoir

Exsanguination - the action of draining an animal or organ of blood.

**Preparing animal for slaughter**

- hosed down to remove excess dirt from their bodies
- inspected before slaughter for injury and illness
- rested overnight, calm and have sufficient access to water
- fasted before slaughter to empty stomach and allow complete bleeding



**Stunning** - animal led into stunning box and stunned by either:

1. Penetrating captive bolt - a gun fires a metal bolt into brain of animal causing it to lose consciousness immediately.

2. Electrical current - is passed through the animal's brain via a large pair of tongs, causing temporary loss of consciousness.

Some systems also pass current through heart, so animal is not just stunned but also killed.

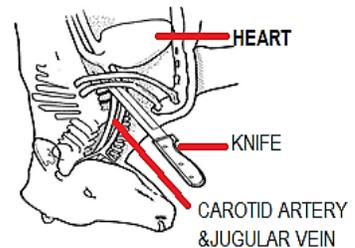
This makes the slaughter painless, motionless and quick.



**2018 – Name one method used to stun cattle prior to slaughtering in the abattoir.**

**Sticking** [bleeding]

- unconscious animal is hung upside down from the ceiling
- carotid artery and jugular vein at base of neck are cut, causing exsanguination
- blood is drained away for blood and bone meal
- incomplete exsanguination increases amount of residual blood in carcass. Lean meat may then appear dark and fat may become streaked with blood



**Skinning**

- head is skinned and cut away from carcass. It is hung on a hook so that it can be identified later
- hide of hanging animal is removed and sent to tannery where it is used to make leather

To avoid contamination, outer side of hide must never touch skinned surface and meat of carcass.



**Evisceration and viscera inspection**

- hanging carcass is cut open starting at anus, allowing internal organs to fall forward, out of the animal. This helps meat inspector check for signs of disease and injury in the lymph nodes and also in internal organs as he removes them.
- edible organs like the kidney, liver and heart are separated from the other organs



**Splitting and washing carcass**

- passed carcass is split in half along the backbone
- carcass is then washed with clean water to remove all dirt

	
<p><b><u>Refrigeration</u></b> - beef carcasses are stored in refrigerated conditions awaiting delivery to customers including butcher shops</p>	

**2017 – Differentiate between exsanguination and evisceration in relation to slaughtering cattle for meat production.**

### **Lesson 5: Products of Beef Farms**

**Lesson Outcome: At the end of this lesson the student will discuss the products and by-products of beef farms.**

Beef cattle are raised mainly for meat:

- (i) veal from calves
- (ii) beef from adult animals

Veal - the flesh of a calf, used as food

Beef - the flesh of a slaughtered full-grown steer, bull, ox, or cow

### **Lesson 6: By-Products of Cattle Farms**

**Lesson Outcome: At the end of this lesson the student will discuss the by-products of cattle farms.**

Tripe - the lining of first and second divisions of stomach of a ruminant, especially oxen, sheep, or goats which is used as food.

Sweetbreads - the thymus gland (from the throat) and the pancreas gland that are taken from calves or lambs.

**2018 – Name the variety meat that is harvested from the thymus gland of calves.**

Tripe - muscle wall of rumen, reticulum and omasum.

### **The edible by-products of cattle farming include:**

- (i) Variety meats including liver, kidneys, brain, tripe, sweetbreads, and tongue.
- (ii) Fats yield oleo stock and oleo oil for margarine and shortening, chewing gum and certain candies.
- (iii) Gelatin produced from bones and skin used in marshmallows, ice cream, canned meats, and desserts.
- iv) Intestines may provide natural sausage casings.

**2017 – MC No. 20**

**Inedible By-products of cattle farming include:**

- (i) Hide makes leather and felt
- (ii) “Camel hair” artists’ brushes made from fine hairs found in ears of beef cattle.
- (iii) Inedible fats from beef are used to produce industrial oils and lubricants and tallow for tanning, soaps, lipsticks, face and hand creams, some medicines, and ingredients for explosives.
- (iv) Fatty acids are used in production of chemicals, biodegradable detergents and pesticides
- (v) Bones, horns, and hooves supply buttons, piano keys, glues, fertilizer, gelatin for photographic film, paper, wallpaper, sandpaper, combs, toothbrushes, and violin string. Bone charcoal is vital in the production of high grade steel ball bearings.
- (vi) Meals made of beef fat, protein, and bones are used in feeding poultry, pigs, dairy cattle, and domesticated fish.
- (vii) Faeces and urine are used for fertilizing materials and digested to produce biogas.

**2017 – Name one fabric or cloth which is produced from the hide (skin) of cattle.**

**2018 – State one use of the faeces and urine that is produced as a by-product of the slaughtering process in abattoirs.**

**Medical By-products**

- more than 100 individual drugs are made of ingredients sourced from cattle
- help to make childbirth safer, settling upset stomach, preventing blood clots in the circulatory system,
- control anaemia, relieve some symptoms of hay fever and asthma and help babies digest milk.

Insulin is perhaps best-known pharmaceutical derived from cattle. It takes the pancreases from 26 cattle to provide enough insulin to keep one diabetic person alive for a year.

Through genetic engineering techniques and other research developments, many of the drugs produced from cattle are now being chemically produced in the laboratory.

These procedures are often less expensive than recovery from animal organs.

However, synthesis has been only partial, and the animal sources remain extremely important in many situations.

**2017 Essay Question No. 5**

**With reference to calves born on Fiji farms, discuss three:**

- ✓ **Identification methods used (3 marks)**
- ✓ **Methods of preventing diseases (3 marks)**
- ✓ **Uses of calves (3 marks)**