SUBJECT:	Agricultural Science
LEVEL:	Forms 4 & 5
TOPIC:	Feed Conversion Ratio (FCR)

CSEC Agricultural Science Syllabus
SECTION C: Animal Production
　　5. **Animal Products**

Specific objective(s):
　　5.2 Determine the dressing percentage (DP) of different farm animals (Economic age, weight and time to slaughter animals, live weight versus carcass weight

Dressing Percentage (DP)

The weight of an animal before it is slaughtered is called **live weight**. After an animal is slaughtered the blood is drained and hide, head, feet and intestines are removed. The **carcass** that remains is described as being **dressed**.

The **dressed weight or carcass weight** is the weight of the dead animal after the head, inedible portions of the feet and tail and the offal have been removed. The **offal** comprises of liver, tongue, heart, kidneys, brain and tripe.

Dressing percentage is the relationship between the live weight and the dressed weight.

Dressing Percentage (DP) is defined as the percent of live animal that ends up as carcass

<u>*Calculating Dressing Percentage*</u>

$$\text{Dressing Percentage (DP)} = \frac{\text{dressed weight in kilograms}}{\text{live weight in kilograms}} \times 100$$

The Dressing Percentage is always expressed as a percentage (%) e.g. for an animal with a Dressing Percentage of 60%; the dressed weight is 60 kg and the live weight is 100kg

The higher the dressing percentage, the more edible meat the live animal had.

<u>*Worked Example 1*</u>

Before slaughter a broiler bird weighed 9kg. After slaughter and dressing, the dressed weight of the carcass was 3kg. Calculate the dressing percentage for this bird.

Step 1 – Write down the formula

Dressing Percentage (DP) = <u>dressed weight in kilograms</u> × 100
live weight in kilograms

Step 2 - Substitute the values into the formula where:
- Dressed weight = 3kg
- Live weight = 4 kg

DP = <u>3 kg</u> × 100
4 kg

Step 3 – Divide 3 by 4 = 0.75

DP = 0.75 × 100

Step 4 – Multiply 0.75 x 100 = 75%

DP = 0.75 × 100 = 75%

Step 5 – Write down the answer

The Dressing Percentage of this broiler bird is 75%

Exercise 1 (answers on page 4)
i. Calculate the Dressing Percentage for a broiler bird with a live weight of 4.2 kg and a dressed weight of 2.1 kg.

ii. A farmer has 100 broiler birds. The average live weight per bird is 2 kg. If broilers have a Dressing Percentage of 80%, calculate the dressed weight that was obtained for the entire flock of birds.

iii. A rabbit has a live weight of 4.5 kg and a dressed weight of 3 kg. What is the Dressing Percentage for this rabbit?

Why is DP important?
The Dressing Percentage is an indicator of how much meat will be obtained from a live animal. It is important to know the Dressing Percentage for animals for the following reasons:
- Indicates to the farmer the value of his live animal
- Determines the payment a farmer can receive for an animal sold on a live weight basis

Is DP the same for all animals?
The Dressing Percentage of animals vary according to their types and classes of animals e.g.:

Type of Livestock	Class of Livestock	Average Dressing Percentage
Non-ruminant	Broilers	75 – 80%
	Pigs	70 – 75%
Pseudo-Ruminant	Rabbits	55 – 65%
Ruminant	Sheep	55 – 60%
	Goats	55 – 60%
	Cattle	50 – 62%

Factors affecting DP in animals

The Dressing percentage of an animal can be affected by the following factors:

- **If the animal fed just before slaughtering** – if the animal was fed just before slaughtering the live weight would be higher than normal due to the weight of the feed consumes and so the Dressing percentage will be reduced
- **Fat level** (marbling of meat) – the greater the fat depth the higher the DP. The more marbling there is in the meat, the higher the DP
- **Gender** – male animals tend to be bigger than the female and so the DP for a male animal is generally higher than that for a female
- **Diet** – animals fed a high roughage diet such as hay, silage or forage tend to have a lower DP than those fed with a high proportion of concentrates (gran feed)
- **Breed** – some breeds tend to have heavier hides, head, feet and viscera e.g. Hereford and Simmental breeds of cattle and as such when these parts are removed from the carcass, their DP tends to be lower
- **Conditions in the stock yard** under which the animals are kept before slaughtering - where the conditions in stockyards are crowded, or there is lack of sufficient feedstuff and/or drinking water, or there is an outbreak of pests infestation the animal can become stressed and there will be a loss in live weight; thereby reducing the DP

References

Government of Alberta. (2020). *Understanding Dressing Percentage of Slaughter Cattle*. Retrieved from Alberta: https://www.alberta.ca/understanding-dressing-percentage-of-slaughter-cattle.aspx

Perrett-Pearson, M., & Ramharacksingh, R. (2020). *Agricultural Science for CSEC Examinations.* London: Macmillan Education.

Ragoonanan, S. (2017). *Agriculture for CSEC - New Edition Revision Course.* La Romaine: Caribbean Educational Publishers (2003) Ltd.

Review Questions:

1. Define the following terms:

Term	Meaning
Live weight	
Dressed weight	
Offal	
Carcass	

2. Define the term **Dressing Percentage**
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3. Calculate the following (answers on page 5):
   a) A bull has a dressed weight of 300kg. If the DP for cattle is 60%, calculate the live weight of this animal.
   b) A farmer has a herd of 50 pigs. The average live weight is 81 kg. If the DP for pigs is 75%, calculate the expected dressed weight of his herd.

4. Explain THREE factors that can affect the DP of an animal.

5. What is the average Dressing Percentage for the following animals:
   a) Rabbit
   b) Broiler
   c) Layer
   d) Sheep
   e) Goat
   f) Pig
   g) Cow

ANSWER SHEET

Exercise 1

   i.   **Calculate the Dressing Percentage for a broiler bird with a live weight of 4.2 kg and a dressed weight of 2.1 kg.**

Step 1 – Write down the formula

$$\text{Dressing Percentage (DP)} = \frac{\text{dressed weight in kilograms}}{\text{live weight in kilograms}} \times 100$$

Step 2 - Substitute the values into the formula where:
- Dressed weight = 2.1kg
- Live weight = 4.2 kg

$$DP = \frac{2.1 \text{ kg}}{4.2 \text{ kg}} \times 100$$

Step 3 – Divide 2.1 by 4.2 = 0.5

$$DP = 0.5 \times 100$$

Step 4 – Multiply 0.5 x 100 = 50%

$$DP = 0.5 \times 100 = 50\%$$

Step 5– Write down the answer

The Dressing Percentage of this broiler bird is 57%

   ii.   **A farmer has 100 broiler birds. The average live weight per bird is 2kg. If broilers have a Dressing Percentage of 80%, calculate the dressed weight that was obtained for the entire flock of birds.**

Step 1 – Write down the formula

$$\text{Dressing Percentage (DP)} = \frac{\text{dressed weight in kilograms}}{\text{live weight in kilograms}} \times 100$$

Step 2 - Substitute the values into the formula where:
- Average live weight = 2 kg
- Dressing percentage = 80%
- Let the average dressed weight per bird = **y** kg

$$80\% = \frac{y \text{ kg}}{2 \text{ kg}} \times 100$$

Step 3 – Express DP as a decimal fraction where 80% = $\frac{80}{100}$ = 0.8

$$0.8 = \frac{y}{2}$$

Step 4 – cross multiply

$$0.8 = \frac{y}{2}$$

Step 5 – Rewrite the equation

$$y = 0.8 \times 2$$

Step 6 – Multiply 0.8 x 2 = 1.6

$$y = 1.6 \text{ kg}$$

The dressed weight for 1 bird is 1.6 kg

Step 7 – Calculate the Dressed Weight for the flock of 100 birds

    If the dressed weight for 1 bird   = 1.6 kg

    Then the dressed weight for the flock of 100 birds   = 1.6 x 100 = 160 kg

Step 8 – Write down the answer

The Dressed Weight for the flock of 100 birds is 160kg

iii. **A rabbit has a live weight of 4.5kg and a dressed weight of 3kg. What is the Dressing Percentage for this rabbit?**

Step 1 – Write down the formula

Dressing Percentage (DP) = $\dfrac{\text{dressed weight in kilograms}}{\text{live weight in kilograms}}$ × 100

Step 2 - Substitute the values into the formula where:
- Dressed weight = 3 kg
- Live weight = 4.5 kg

$$DP = \frac{3 \text{ kg}}{4.5 \text{ kg}} \times 100$$

Step 3 – Divide 3 by 4.5 = 0.666 = 0.67 (correct to 2 decimal places)

Step 4 – Multiply 0.67 x 100 = 67%

$$DP = \frac{2.1 \text{ kg}}{4.2 \text{ kg}} \times 100 = 50\%$$

Step 4 – Write down the answer

The Dressing Percentage of this broiler bird is 57%

Review Questions

3. **Calculate the DP for the following animals (answers on page 4):**
   a. **A bull has a dressed weight of 300kg. If the DP for cattle is 60%, calculate the live weight of this animal.**

Step 1 – Write down the formula

Dressing Percentage (DP) = $\dfrac{\text{dressed weight in kilograms}}{\text{live weight in kilograms}}$ × 100

Step 2 - Substitute the values into the formula where:
- Dressed weight = 300 kg
- Dressing percentage = 60%
- Let the live weight = **y** kg

$$60\% = \frac{300 \text{ kg}}{y \text{ kg}} \times 100$$

Step 3 – Express DP as a decimal fraction where 60% = $\dfrac{60}{100}$ = 0.6

$$0.6 = \frac{300}{y}$$

Step 4 – cross multiply

$$0.6 = \frac{300}{y}$$

Step 5 – Rewrite the equation

$$0.6 \, y = 300$$

Step 6 – make y the subject of the formula

$$y = 300 \div 0.6$$

Step 6 – Divide 300 by 0.6 = 417 kg (correct to the nearest whole number+

$$y = 500 \text{ kg}$$

Step 7– Write down the answer

The Live Weight for this cow is 500 kg

b. A farmer has a herd of 50 pigs. The average live weight is 81kg. If the DP for pigs is 75%, calculate the expected dressed weight of his herd.

Step 1 – Write down the formula

Dressing Percentage (DP) = $\underline{\text{dressed weight in kilograms}}$ ×   100
                                                live weight in kilograms

Step 2 - Substitute the values into the formula where:
- Average live weight = 81 kg
- Dressing percentage = 75%
- Let the average dressed weight per pig = **y** kg

75%   = $\dfrac{\text{y kg}}{81 \text{ kg}}$ × 100

Step 3 – Express DP as a decimal fraction where 75% = $\dfrac{75}{100}$ = 0.75

0.75   = $\dfrac{y}{81}$

Step 4 – cross multiply

0.75   = $\dfrac{y}{81}$

Step 5 – Rewrite the equation

y   =   0.75 × 81

Step 6 – Multiply 0.75 x 81 = 60.75

y   =   60.75 kg
The dressed weight for 1 pig is 60.75 kg

Step 7 – Calculate the Dressed Weight for the herd of 50 pigs
If the dressed weight for 1 pig   = 60.75 kg
Then the dressed weight for the herd of 50 pigs   = 60.75 × 50 = 3,037.5 kg

Step 8 – Write down the answer
The Dressed Weight for the herd of 50 pigs is 3,037.5 kg