

 **Activity 7.2.2 Playing the Average****Purpose**

Have you ever wondered how people are compared to each other? Student comparison occurs when a teacher curves class scores or schools compare students using grade levels. In the livestock industry, producers compare animals to each other as well. Producers compare animals to select parents for future generations. Animals that outperform their peers are expected to have high performing offspring.

One way to compare animals to each other is by using a simple ratio. Ratios compare an individual with the group average using the following formula.

$$\frac{\text{Individual measurement}}{\text{Group average measurement}} \times 100$$

A ratio of 100 is average for a group. Numbers above 100 exceed the group average while numbers below 100 indicate an individual is below average. A ratio of 102 would be two percent above the average for a group while a ratio of 94 would be six percent below the average for a group. Ratios are sometimes incorrectly called indexes. Although based on the same scale where 100 is average, indexes use several traits while ratios analyze variation in a *single* trait among a group of animals.

For ratio comparisons to be valid, they must be made among individuals within a contemporary group. A contemporary group consists of individuals about the same gender, age, and raised in identical environmental conditions.

Livestock producers use ratios to compare animals of the same gender within a group for traits like average daily gain, birth weight, weaning weight, and yearling weight. Then select animals with the highest ratios as breeding stock to improve those traits in future generations.

Materials**Per gender:**

- 10ft tape measure

Per student:

- Pencil
- *Agriscience Notebook*

Procedure

In this activity, you will develop a ratio for female and male class members for height. Next, you will apply this to animal situations.

Part One – Student Height Ratio

1. Measure the height of each of the females in the class and record the height measurement in inches in Table 1 on *Activity 7.2.2 Student Worksheet*.
2. Repeat the procedure for males and record each male's height measurement in Table 2.
3. Calculate the average height for females by adding all the female heights and dividing the sum by the number of females. Repeat the averaging procedure for males.
4. Calculate a ratio for each class member within his or her gender. Use the formula provided above.

Table 3. Applying Ratios

Ram Number	90-Day Weight (lbs)	90-Day Weight Ratio
1	88	
2	91	
3	103	
4	79	
5	84	
6	101	
7	97	
8	99	
9	86	
10	90	
Average		

Part Two Analysis Questions

- If you were selecting rams to sire lambs with a high 90-day weight, based on your findings, which ram would you select?
- What is the average ratio for the group?
- How many percent difference is there between the highest performing ram and the next highest?
- What is the difference in the ratios between the highest and lowest performing rams?