

Contemporary Group Ratios

Concepts

- Analyze a herd of cattle to decide which ones to breed and which ones to cull

Overview

Using list manipulation, determine how an individual compares to the whole group with which it was raised.

Materials

- TI-84 Plus

Introduction

Contemporary group ratios are used to compare animals raised in the same environmental conditions. They give an indication of how much better or worse an individual animal is from the average of the group with which it was raised.

To calculate a ratio, you first must get an average for the entire group. You will then divide each individual's measurement by the average of the group and change this to a percentage.

This value gives you the ratio of the individual compared to the average of the entire group.

Here is a table of weaning weights for 10 calves that you will use to calculate individual ratios.

Tag Number	Weaning Weight (pounds)
1	500
2	435
3	615
4	505
5	465
6	500
7	590
8	490
9	480
10	595

Procedure

Enter the data from the table into the TI-84 Plus according to the following directions.

1. Press **ON** **STAT** **ENTER** (or press **1** after **STAT**).
2. Use the directional arrows on the TI-84 Plus keypad to move to the top of L1.
 - Make sure that L1 is highlighted.
 - Press **CLEAR** **ENTER**. L1 should be cleared of all data. See Figure 1.
3. Follow the same procedure to clear all lists of data.
4. Scroll back to L1, making sure the cursor is in the first row of the list and not at the top.
5. In L1, enter the data for Weaning Weight.
 - To do this, type the number, and press **ENTER** or press the down arrow **▼**.
 - Repeat this until all of the data are entered.
6. Press **2nd** **MODE** (for **QUIT**) to return to the Home Screen.
7. Press **CLEAR** to erase everything on this screen.
8. Now determine the average (mean) weaning weight of all the calves. To do this, find the sum of their weights and then divide by 10 (the number of calves).
9. Press **2nd** **STAT** **▶** to the MATH menu.
10. Press **5** for 5:Sum.
 - This should take you back to the Home Screen. See Figures 2 and 3.
11. Press **[L1]** **)** **ENTER** to find the sum of all the weights in L1. See Figure 4.
12. Divide this value by 10, and enter the average weaning weight: _____ pounds.

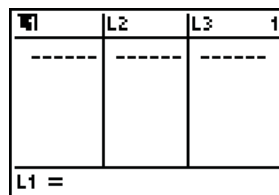


Figure 1



Figure 2

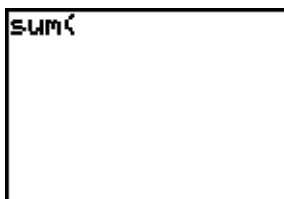


Figure 3

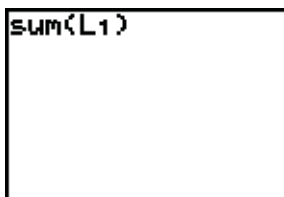


Figure 4

13. Press **[STAT]** **[ENTER]** to go back to the list of the weaning weights.
14. Press **[▲]** **[▶]** to move to the top of L2.
15. To determine the ratio of individual weights to average weight, divide each of the entries in L1 by the average.
 - Make sure the cursor is at the top of L2, and press **[2nd]** **[L1]**/**517.5** **[ENTER]**. See Figures 5 and 6.

Analysis

1. What do you need to do so that the numbers in L2 will represent percentages?

2. Press **[MODE]** **[▼]** **[▶]** **[▶]** **[ENTER]** to round the percentages to one decimal place.
3. Go back to L2, and move the cursor to the top of L2.
4. Press **[2nd]** **[2]*****100** **[ENTER]**. See Figures 7 to 9.
 - What do these numbers represent?

 - How would you explain a calf that had a value of 100 in this list?

L1	WR	L3	2
500	-----	-----	
435			
615			
505			
465			
500			
590			
L2=L1/517.5			

Figure 5

L1	L2	L3	2
500	.96618	-----	
435	.84058		
615	1.1884		
505	.97585		
465	.89855		
500	.96618		
590	1.1401		
L2C1=.9661835748...			

Figure 6

Normal	Sci Eng
Float	0.23456789
Angle	Degree
Func	Par Pol Seq
Connect	Dot
Sequenc	Simul
Real	a+bi, re^θi
Full	Horiz G-T

Figure 7

L1	WR	L3	2
500	.96618	-----	
435	.84058		
615	1.1884		
505	.97585		
465	.89855		
500	.96618		
590	1.1401		
L2=L2*100			

Figure 8

L1	L2	L3	2
500.0	96.6	-----	
435.0	84.1		
615.0	118.8		
505.0	97.6		
465.0	89.9		
500.0	96.6		
590.0	114.0		
L2C1=96.61835748...			

Figure 9

Practice Problem

Determine the yearling weight ratios for the following calves using the procedures described above, and record your answers in the table provided.

Calf Tag	Weight	Ratio
1	800	
2	725	
3	818	
4	850	
5	775	
6	700	
7	760	
8	830	
9	800	
10	785	

Discussion Questions

1. What factors influence weaning weight?
2. Rank each factor you listed in Question 1 according to its importance. Justify your response.