

Activity 5.5.2 Pearson's Square Meal

Purpose

Feeding animals is not a chore livestock producers take lightly. The financial, health, and production gains from a good feeding program are essential to the long-term viability of an animal operation. Yet balancing a ration, or providing animals with all the nutrients each animal needs in the right proportions and amounts, can be an intimidating task. It is difficult to balance a ration by trial and error and can be costly if not done correctly.

Often times a producer meets the nutritional requirements of an animal using two feedstuffs. The Pearson Square is a useful tool for blending two feedstuffs with different nutrient concentrations into a mixture with a desired concentration. The Pearson Square method is used to calculate the proportion of two feeds to be mixed together based on the percentage of a specific nutrient. How much grain and hay should be fed to an animal to feed 18% CP?

Materials

Per student:

- *Modern Livestock and Poultry Production* textbook
- Calculator
- Pencil
- 1 8.5"x11" sheet of paper
- *Agriscience Notebook*

Procedure

In this activity, you will formulate rations based on the nutritional needs of an animal. You may find Chapter 8 in your textbook helpful as a reference and for additional examples.

Part One – How to use the Pearson Square

The following problem is an example of how to use the Pearson Square method for blending two feedstuffs with different nutrient concentrations.

1. Fold a sheet of paper in half vertically once and in half horizontally twice making 8 spaces after you unfold it.
2. Number the first six spaces from left to right and top to bottom, 1 – 6.
3. Draw a line directly under the six spaces and above the bottom two spaces following the fold.
4. Use the bottom space for any notes or questions you may have.

You are mixing a feed for your Duroc feeder hogs. Using yellow corn and cottonseed meal, formulate 50 pounds of a mixture that contains 18% crude protein (CP) on an as-fed basis.

%CP of yellow corn	= 8.6	}	From feed analysis completed in a lab. For average data see the NRC Composition Tables
%CP of cottonseed meal	= 41.4		
%CP desired in the ration	= 18	~	Protein need of hogs

Step 1 – Drawing the Pearson Square.

- On your paper in the space labeled 1, draw a one to two inch square.
- Draw diagonal lines from corner to corner, leaving a space in the middle (See Figure 1).

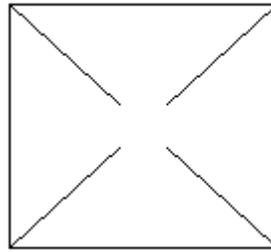


Figure 1. Pearson Square Template

Step 2 – Inputting the facts you know.

- In space 2 of your paper, redraw the square and write the % of the nutrient for which you are calculating in the center.
- On the left side of the square, write in the feeds and percentage of the nutrient supplied on the top and bottom corners.

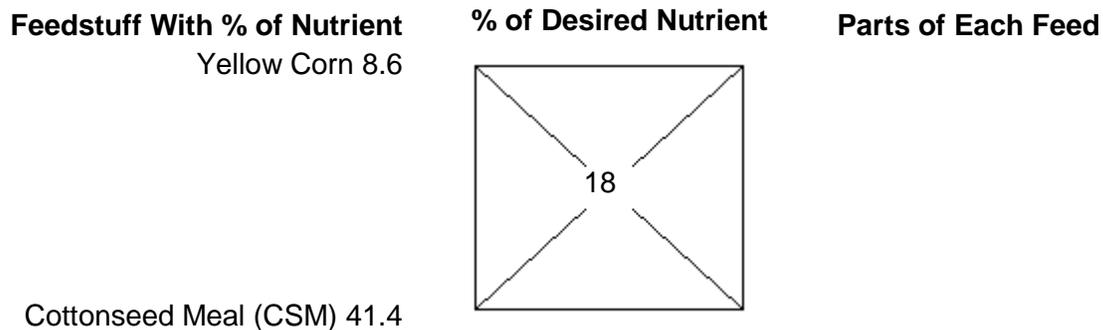


Figure 2. Pearson Square Set-up

Step 3 – Determining the proportion of each feed.

- In space 3, redraw everything from space 2.
- Subtract across the diagonal for each feedstuff.
- The result gives you the parts of each feedstuff in the ration.
- Read across the square to determine the proportion of each feed to use in the ration.

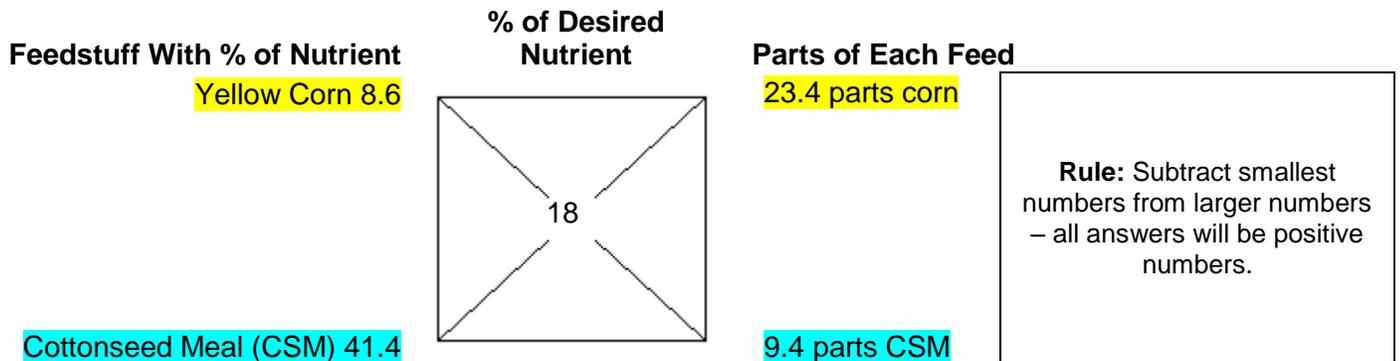


Figure 3. Pearson Square Solved

Name: _____

Activity 5.5.2 Student Worksheet

Directions: Solve the following problems using the Pearson Square. Please show your work.

1. Formulate 100 pounds of a ration with 18% CP using yellow corn (10.1% CP) and soybean meal (42.5% CP).

Answer: _____ lbs yellow corn _____ lbs soybean meal

Check your work (Step 6)

2. Formulate a 600kg mixture with 20% protein of barley (13.5% CP) and canola meal (40.9% CP).

Answer: _____ kg barley _____ kg canola meal

Check your work (Step 6)

3. You have a 400kg Murray Grey nursing cow who needs 2.11kcal of ME per kilogram of feed in her daily ration. Using oat hay (1.99kcal ME/kg) and corn (3.25kcal ME/kg) formulate 500kg of a mixed ration.

Answer: _____ kg oat hay _____ kg corn

Check your work (Step 6)