# Balancing Feed Rations: Pearson Squares

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## Sample Problem

- Formulate 600 lbs of a 26% CP ration using CSM (54% CP) and Barley (8% CP).

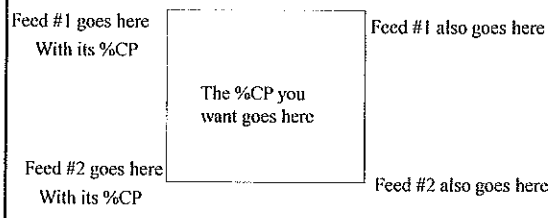
## What's Being Asked?

- You have 2 different feeds on hand, each containing a certain amount of protein. But for your purposes, neither will suffice. You need to _____ them to make a new feed of a specific amount _____. And you need to make 600 lbs of the new feed.

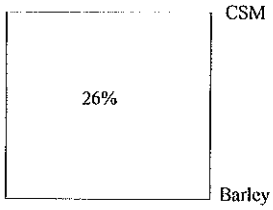
## Solving.....using a Pearson Square

- These types of problems are easy....but you have to use the Pearson Square.
  - 1st set up the square (this will be the same every time:

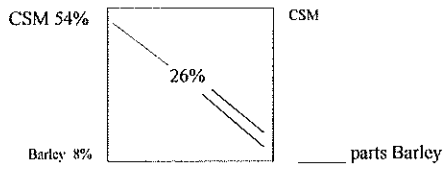
- 2nd, label the square:



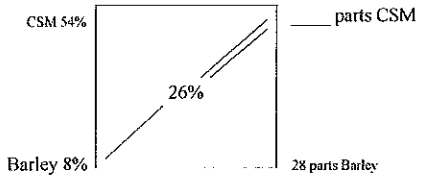

## This is what it should look like:



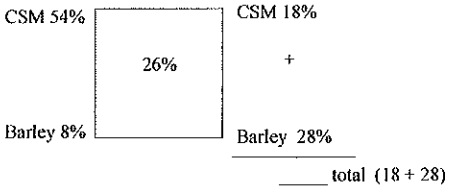
- 3rd, some simple subtraction…one feed at a time.
  - Subtract going diagonally: #1. CSM (54) – 26 = 28% Barley:




- 4th, do the same calculation for the second feed.
  - Subtract on the other diagonal: Barley (8%) – 26 = -18 % CSM. But just use the absolute value….ignore the negative sign:




- 5th, add up total parts CSM and Barley for the new feed:




## Wait….What's going on?

- We just calculated what percent of our new ration will be CSM and Barley: of the total amount of new feed, it will be 28 parts Barley and 18 parts CSM. Now we have to determine how many pounds of each this correlates to. Once we know that, we can mix our feeds together.

- So from the square, we know that in our final feed we need:
  - 28 parts Barley
  - 18 parts CSM
- We also know from the problem that we need 600 lbs of the new feed.
  - This is the easy part!

## Just convert parts to %:

- Remember the formula for percentage:
  - Part/whole x 100 = %part
- Barley:
  - 28 parts / 46 total parts x 100 =_____%
- CSM:
  - 18 parts / 46 total parts x 100 = _____%

## Then convert % to lbs:

- Now we know what % of final feed will be barley and CSM, and from the problem, we know we want 600 total lbs of feed. We just need to figure out how many lbs of each this means!
  - Barley: 600 lb x .6087 = 365.22 lbs!
  - CSM: 600 lb x .3913 = 234.78 lbs!
  - This is your answer! You need to mix 365.22 lbs barley and 234.78 lbs CSM to make your mix!

## Let's Check the Answer

- Barley: we determined 365.22 lbs needed; and from the problem we know that our barley is 8% CP;
  - 365.22 x 0.08 = 29.22 lb CP
- CSM: we determined 234.78 lbs needed; from the problem we know CSM is 54% CP;
  - 234.78 x 0.54 = 126.78
- These two answers should add to give the percent CP we were looking for:
  - 29.22 + 126.78 = 156
  - 156 lb CP / 600 total lb feed x 100 = 26% CP

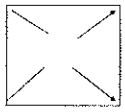
## Ready for another one?

- A zelephant is on a feed that requires a ration containing 55% TDN. The TDN of two feeds, alfalfa hay and corn, are 89% and 22%, respectively. Determine the amounts of each feed necessary (in units/300 lbs) to meet the TDN requirement of the zelephant.

## Hints!

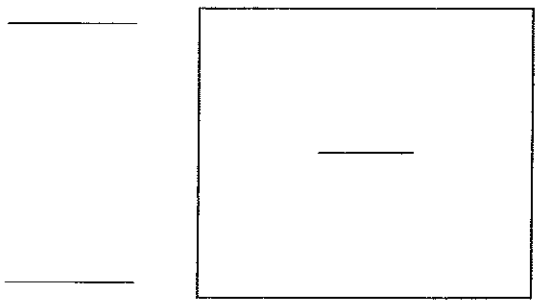
- Remember the steps:
  - 1. Set up the square and label it: the labels stay the same going across!
  - 2. Subtract going DIAGONALLY
  - 3. Get total parts
  - 4. Find each feed % from the total parts
  - 5. Convert the % to lbs based on total amount feed we need
  - 6. Check your answer!

## Answer



Practice with Pearson Square Name:

1. 14% Crude Protein Ration, 100 lb total feed
   Corn has 10% Crude Protein; Soybean Meal has 45% Crude protein



Total Parts:

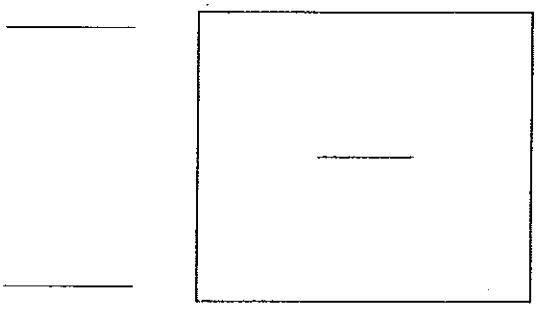
Percent Corn: _____

Percent SM: _____

Lb Corn: _____

Lb SM: _____

2. 25.5% Crude Protein Ration, 3,000 lb
   Barley has 11% Crude Protein; Soybean Meal has 45% Crude protein



Total Parts:

Percent Barley:

Percent SM:

Lb Barley:

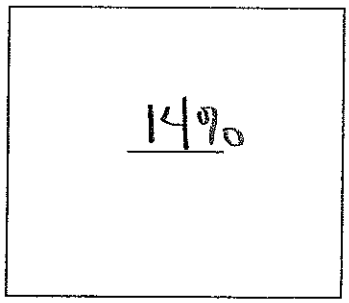
Lb SM:

Practice with Pearson Square

Name: Key

1. 14% Crude Protein Ration, 100 lb total feed
   Corn has 10% Crude Protein; Soybean Meal has 45% Crude protein

Corn 10%




3% corn

SB 45%

4% SB

Total Parts: 35% = whole

Percent Corn: 3%

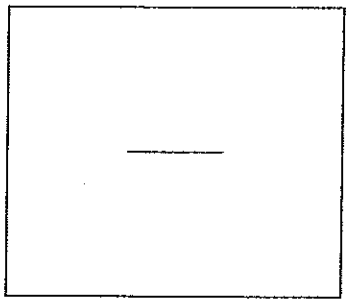
Percent SM: 4%

Lb Corn: _____

Lb SM: _____

2. 25.5% Crude Protein Ration, 3,000 lb
   Barley has 11% Crude Protein; Soybean Meal has 45% Crude protein

_____ _____



_____ _____

Total Parts:

Percent Barley:

Percent SM:

Lb Barley:

Lb SM: