

**Activity 5.5.3 Snack Time****Purpose**

As you return home from school one day, you open the door of your home to the wonderful aroma of freshly baked cookies. Fresh chocolate chip cookies made directly from the recipe on the back of the bag of chocolate chips cover the countertop. Have you ever wondered how recipes are determined? Some recipes are developed by repeated trials until the perfect cookie is made and other recipes are designed to provide specific nutrients.

Developing recipes for specific nutrients, such as the protein bar you saw on the shelf at a mini-mart, is much like developing a ration for animals. Ingredients are added to provide protein and supplements are used to add flavor or missing nutrients. How can you use the Pearson Square method to help determine the recipe of a ration for specific purposes?

**Materials****Per team of three students:**

- \_\_\_cup Chex® cereal
- \_\_\_cup pretzels
- \_\_\_cup M&M's®
- 1T warm butter
- Small bowl
- Measuring cups
- Disposable gloves

**Per student:**

- Calculator
- Pencil
- *Agriscience Notebook*

**Procedure**

In this activity, you will use the Pearson Square method to develop a ration to use as the basis of a recipe. Your job as a feed specialist is to develop a blend of feeds to provide 6.5% protein. Your feed will be called “Chex® Mix.” You will be assigned to work in a ration development team consisting of three students.

In your team, you will complete the following steps in ration formulation. You know the percent protein needed in the final product is 6.5%.

**Step 1 – Determine the Percentage of Protein in Feedstuffs**

Feedstuff	Grams protein/serving	% CP	Use the following formula $\left(\frac{gCP}{g/serving}\right) 100 = \%CP$
Chex® cereal	2g / 31g		
M&M's®	2g / 47.9g		
Pretzels	5g / 60g		

**Step 2 – Complete a Pearson Square for the Premix**

Your feed requires an initial mix (premix) of Chex® cereal and pretzels. Your teams target is a mix that contains 7% protein.

Chex<sup>®</sup> cereal \_\_\_\_\_% \_\_\_\_\_ parts

Pretzels \_\_\_\_\_% \_\_\_\_\_ parts

\_\_\_\_\_ total parts

( \_\_\_\_\_ parts / \_\_\_\_\_ total parts ) \* 100 = \_\_\_\_\_% Chex<sup>®</sup> cereal  
 ( \_\_\_\_\_ parts / \_\_\_\_\_ total parts ) \* 100 = \_\_\_\_\_% Pretzels

You now have your premix.

**Step 3 – Pearson Square for the Final Mix**

Using your premix, add M&M's<sup>®</sup> and calculate the final mixture at 6.5% protein. Remember the premix has 7% protein.

Premix \_\_\_\_\_% \_\_\_\_\_ parts

M&M's<sup>®</sup> \_\_\_\_\_% \_\_\_\_\_ parts

\_\_\_\_\_ total parts

( \_\_\_\_\_ parts / \_\_\_\_\_ total parts ) \* 100 = \_\_\_\_\_% Premix  
 ( \_\_\_\_\_ parts / \_\_\_\_\_ total parts ) \* 100 = \_\_\_\_\_% M&M's<sup>®</sup>

**Step 4 – Determine the Quantity of Each Ingredient**

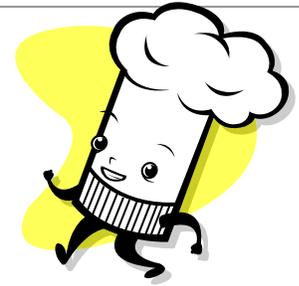
Make 2 cups of your ration. First determine how many cups of premix and M&M's<sup>®</sup> are needed. Round your amounts to the nearest 1/4 or 1/3 cup. Complete the recipe card below as you determine the quantity of each ingredient.

2 cups ration x \_\_\_\_\_% premix = \_\_\_\_\_ cups premix ≈ \_\_\_\_\_ cups  
 2 cups ration x \_\_\_\_\_% M&M's<sup>®</sup> = \_\_\_\_\_ cups M&M's<sup>®</sup> ≈ \_\_\_\_\_ cup

\_\_\_\_\_ cups premix x \_\_\_\_\_(% Chex<sup>®</sup>) = \_\_\_\_\_ cups Chex<sup>®</sup> ≈ \_\_\_\_\_ cups  
 \_\_\_\_\_ cups premix x \_\_\_\_\_(% pretzels ) = \_\_\_\_\_ cups pretzels ≈ \_\_\_\_\_ cup

## Chex<sup>®</sup> Mix Ration ~ 6.5% Protein

*Developing a recipe is much like developing a ration. You must determine the correct quantities of each ingredient to make an enjoyable food.*



### Ingredients:

\_\_\_\_\_ cups Chex<sup>®</sup> cereal  
\_\_\_\_\_ cup M&M's<sup>®</sup>  
\_\_\_\_\_ cup Pretzels  
1T Butter

### Directions:

1. In your mixing bowl, combine the ingredients for your premix.
2. Add the correct quantity of M&M's<sup>®</sup>.
3. Mix in the butter, making sure to coat the other ingredients completely.
4. Enjoy!

### Step 5 – Mix the Ration

1. Show all of your work to your instructor for approval.
2. Once approved, all team members should wash their hands.
3. Designate the following jobs:
  - Recipe reader
  - Measurer
  - Mixer (needs to put on gloves)
4. Follow the directions on your newly created recipe (ration) card.

Clean up your area and wash your equipment.

### Conclusion

1. How does your Chex<sup>®</sup> Mix ration compare to a livestock ration?
2. Why is it important to know how to balance a ration for an animal?
3. How can you use your understanding of balancing rations in your own nutritional decisions?