

# Find The Right Mix

## Total Mixed Ration

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# Tennessee 4-H Youth Development

## *Find the Right Mix*

### *Total Mixed Ration*

#### **Skill Level**

Beginner

#### **Learner Outcomes**

*The learner will be able to:*

- Create 1 pound of trail mix.
- Multiply decimals.
- Understand the types of food dairy cows need to produce high-quality milk.

#### **Educational Standard(s) Supported**

4.OA.A.1

5.NBT.A.1

#### **Success Indicator**

*Learners will be successful if they:*

- Follow a recipe.
- Measure correctly using a scale.
- Understand the types of food dairy cows need to produce high-quality milk.

#### **Time Needed**

45 minutes

#### **Materials List**

Scale

Mini Pretzel Sticks

Candy Corn

M&Ms

White Yogurt Raisins

Sugar Babies

Mixing Bowl

Mixing Spoon

Small Individual Bowls or Cups

#### **Introduction to Content**

TMR stands for "Total Mixed Ration," which is a way that dairy farmers ensure that dairy cows get a balanced diet. Dairy farmers weigh the right combination of ingredients and then mix it together. This provides the correct amount of nutrients for their cows.

#### **Introduction to Methodology**

Students will learn about the different nutrients that cows need. They will create their own trail mix from ingredients that represent the ingredients eaten by cows. They will complete a multiplication handout that asks them to measure the ingredients needed for a larger batch of trail mix, much like a dairy farmer mixes feed for their herd.

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## Terms and Concepts Introduction

Total Mixed Ration (TMR): A diet providing all the nutrition requirements a cow needs to be healthy and produce milk.

Forage: A variety of grasses and grains that provide high levels of energy, protein, carotene and calcium to help cows grow and produce milk.

Energy: Comes from food (carbohydrates, proteins, fats) and helps the cow grow and produce milk.

## Setting the Stage and Opening Questions

Ask students:

- **Have you ever eaten trail mix?**
- **What types of food are usually included in trail mix?**
- **Why do people eat trail mix?**

Lead students through a discussion that emphasizes that trail mix is an inexpensive snack that combines different types of food to provide high amounts of energy.

Ask students:

- **Did you know that dairy farmers feed a type of trail mix to cows for the same reasons?**

Explain to students that a Total Mixed Ration (TMR) is a completely balanced diet that farmers feed to their cows. They take different ingredients and combine them the same way we are going to combine ingredients today to make trail mix.

Tell students: **By the end of the lesson today, you will be able to follow a recipe, measure correctly using a scale, and understand the types of food dairy cows need to produce high-quality milk.**

## Experience

Divide students into groups of 3-4. Provide each group with the following ingredients:

Mini Pretzel Sticks: These represent forages like corn silage or alfalfa hay. These provide high energy through protein, caroten, and calcium to help the cow produce high-quality milk.

Candy Corn: This represents corn, which is another source of energy for the cow.

M&Ms: These protein representatives help provide energy for the cows.

White Yogurt Raisins: These represent cottonseed, which is a great source of fiber, protein and fat.

## Tips for Engagement

Have all the materials needed for this lesson prepared ahead of time.

**Sugar Babies:** These represent a sugar source or liquid feed. Molasses is a common type of liquid feed. Liquid feeds provide the cow with carbohydrates, sugars, protein and additional nutrients. It also helps dry feed stick together. Farmers don't always need extra sugar in the ration, so the sugar babies can be an optional ingredient.

Invite students to guess what each ingredient represents. After they have guessed, describe each ingredient and its representative role in a cow's diet.

## Share

Tell students, "TMR stands for 'Total Mixed Ration,' which is a way that farmers ensure that dairy cows get the right mix of food for their diet. Dairy farmers weigh out the right ingredients, then mix them together. Like your family might use a mixing bowl, farmers use a giant mixer called a feed mixer to ensure each bite the cow takes has the nutrients, or energy, protein, minerals and vitamins, needed by the cow."

## Process

Tell students they will make one pound of trail mix. Give each student the "Find the Right Mix" handout. Assist students in using the scale to weigh each ingredient and mix it together in a bowl. After it is prepared, give students an individual cup or bowl of the trail mix to eat.

## Generalize

Tell students that they need to create a plan to make 10 pounds of TMR to share with their friends. To find out how much of each ingredient they need, they will multiply the percentage of that ingredient by 10 pounds. Guide students through the multiplication process, giving help as needed. See Finding the Right Mix Handout for guidance.

## Apply

Ask students the following questions:

- How is a farmer mixing a Total Mixed Ration (TMR) similar to someone baking a cake? How is it different?
  - *Suggested answer: It is similar because it requires a specific ingredient in a set amount. It is different because a TMR makes sure cows get all the nutrients they need, while the correct ingredients for a cake are needed so it will properly bake.*
- Why do farmers provide a TMR instead of letting cows eat whatever they want?
  - *Suggested answer: The cow needs the correct amount of energy, protein, minerals and vitamins to stay healthy and produce milk.*

### Life Skill(s)

4<sup>th</sup> Grade

- Follow instructions. (Head)
- Gather relevant information for decision-making. (Hands)

5<sup>th</sup> Grade

- Participate in 4-H club meetings by saying pledges, completing activities and being engaged. (Head)

## ***Supplemental Information***

### ***Educational Standards Met***

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4.OA.A.1 Interpret a multiplication equation as a comparison (e.g., interpret  $35 = 5 \times 7$  as a statement that 35 is 5 times as many as 7 and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.

5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and  $1/10$  of what it represents in the place to its left.

#### **Source:**

Total Mixed Ration (TMR). (2013, March 25). Retrieved from <https://agunited.org/news-and-events/total-mixed-ration-tmr/>

## Find the Right Mix

Trail Mix Recipe for 1 lb. (in-class demonstration)

55% forage = .55 lb. Pretzels  
20% corn = .20 lb. Candy Corn  
15% protein = .15 lb. M&Ms  
5% cotton seed = .05 lb. Yogurt Raisins  
5% sugar source = .05 lb Sugar Babies

Mix ingredients together.

Now, create a plan to make 10 pounds of TMR to share with your friends. To find out how much of each ingredient you need, multiply the percentage of that ingredient by 10 pounds.

Pretzels (Forage) 55%

.55 pretzels x 10 pounds = 5.5 pounds of pretzels

Candy Corn (Corn) 20%

.20 candy corn x 10 pounds = 2 pounds of candy corn

M&Ms (Protein) 15%

.15 M&Ms x 10 pounds = 1.5 pounds of M&Ms

Yogurt Raisins (Cotton Seed) 5%

.05 yogurt raisins x 10 pounds = .5 pounds of yogurt raisins

Sugar Babies (Sugar Source/Liquid Feed) 5%

.05 sugar babies x 10 pounds = .50 pounds of sugar babies