DEPARTMENT OF THE ARMY
HEADQUARTERS, 10TH MOUNTAIN DIVISION (LIGHT INFANTRY) AND FORT DRUM
FORT DRUM, NEW YORK 13602-5000

INSTRUCTION FOR LEADER

Complete outlined tasks in preparation for training. During training, you will read the script directly and complete an AAR. The script includes optional check on learning activities to verify Soldiers understand the lesson.

PREPARATION

1. Print and review this leader guide to ensure subject familiarity.
2. Print enough handouts for number of Soldiers in training.

OBJECTIVE

1. Soldiers will be able to identify nutritional value provided in operational rations and be able to develop a performance nutrition plan that aligns with the specific requirements of various missions.

SCRIPT TO BE READ DIRECTLY

1. **Audience Engagement Questions:**
    a. [Instructor asks]: "How many calories are in 1 MRE (Meal, Ready-to-Eat)?"
        (1) Answer: 1300kcal
    b. [Instructor asks]: What are some things you've heard soldiers say about MREs and other operational rations that you believe are possibly myths?
        (1) [Instructor]: Share a few examples you may have heard or share from these examples taken from a Google search "common misperceptions of MREs":
            (a) "made of chemicals and preservatives; not real food ingredients"
            (b) "designed to cause constipation to keep from having to go to the bathroom while on a mission"
            (c) "the gum is a laxative to use for after mission is over"
        (2) [Instructor]: These are myths. Most of what people say about MREs is not accurate.
    c. [Instructor asks]: Do you eat your MREs while in the field? For those that don't, what do you consume instead? Do you believe it is nutritionally equivalent or better, why, and how so?
2. **Overview of Operational Rations:** The Department of Defense (DoD) continuously works to improve combat rations so that they meet the nutritional needs of

Warfighters, improve health and performance, and are more acceptable (tasty). The latest update, MRE 43, includes a new pepperoni pizza slice that has been highly anticipated.

The DoD Combat Feeding Program makes rations for general use, assault, special purpose, group, and supplements/enhancements. These include MRE (Meal, Ready-to-Eat), FSR (First Strike Ration), CCAR (Close Combat Assault Ration), MCW (Meal, Cold-Weather), UGR (Unitized Group Rations), and MORE (Modular Operational Ration Enhancement). The MRE is the primary ration for individual consumption, while UGR-A is the primary ration provided during field training for groups and requires a field kitchen for preparation.

3. **Nutrition Quality in Operational Rations:** Nutrition is crucial for successful military operations, as it helps optimize performance and health. Operational rations are designed to meet the unique nutritional needs of Warfighters, which are different from those of civilians. The three pillars of building a meal that supports optimal health are a proper balance of macronutrients (protein, carbohydrates, and fat), adequate calories, and a wide variety of micronutrients (vitamins and minerals). Combat rations go through a rigorous process to ensure they meet nutrition standards, shelf stability, and consumer acceptance.
    a. **MRE (Meal, Ready to Eat):** 1300 calories/meal. 3 MREs equals days' worth of food. 24 Menus. 3-year shelf stability. *General Purpose.*
    b. **FSR (First Strike Ration):** 2900 calories/ration pack (contains 3 meals). 9 Menus. 3-year shelf stability. *Compact, Eat on the Move, ration. Purpose: initial stages of intense conflict or foot patrol.*
    c. **CCAR (Close Combat Assault Ration):** 2800 calories/ration pack (contains 3 meals). 3 Menus. 3-year shelf stability. *Compact, eat-on-the-move ration. Purpose: to replace **FSR** during semi-independent and dispersed operations up to 7 days without resupply.*
    d. **MCW (Meal, Cold Weather):** 1540 calories/meal. 3 MCWs equals 1-day worth of food. 12 Menus. 3-year shelf stability. *Purpose: replaces MRE in extreme cold weather to meet nutritional requirements for mission and optimize water requirements.*
    e. **MORE (Modular Operational Ration Enhancement):** 1,000 calories per pack. 2 Types. 3-year shelf stability. *Augmentation to individual rations (MRE, CCAR, MCW) where nutrition needs are increased or altered: high altitude or cold weather (Type I) and hot weather (Type II).*
    f. **MORE-Performance Pack:** 1400 calories per pack. *Added type to meet unique nutritional needs and SOF and other operators conducting highly strenuous missions.*

g. **UGR (Unitized Group Ration):** Four types: "Heat & Serve" (1350 calories/meal; 5 breakfast and 10 lunch/dinner options), "A" (1500 calories/meal; 7 breakfast and 14 lunch/dinner options), "Express" (1300 calories/meal; 4 breakfast and 8 lunch/dinner options). *Group rations feeding approximately 50 Warfighters per module. Requirement of field kitchen equipment and capabilities vary.*

4. **Performance Nutrition in Operational Environment:**
   a. **Energy Balance:** Operating in extreme environments (high altitude, cold, and heat) increases energy demands on the body, especially when combined with heavier equipment loads and uneven terrain. This means the body needs more energy (calories) coming in as well. Failure to meet calorie requirements can lead to weight loss, muscle loss, decreased performance, or worse.
      (1) Reference handout for estimations of recommended daily intake per activity level.
   b. **Macronutrient Ratios (Carbohydrates, Proteins, Fats):**
      (1) **Carbohydrates** are the primary fuel source for muscles during moderate to heavy exercise. Strenuous activity requires more carbs. Adequate amounts of carbohydrate is crucial for endurance, coordination, concentration, and recovery.
         (a) **Recommended daily intake:** 3 grams per 1lb body weight. Ex: 600g carb for 200lb Warfighter
      (2) **Protein** is crucial for muscle recovery, adaptation, and injury recovery. It is not an efficient or effective source of energy for performance, but necessary for refueling and supporting muscles after physical activity.
         (a) **Recommended daily intake:** 0.7 grams per 1lb body weight. Ex: 140g protein for 200lbs Warfighter.
      (3) **Dietary fats** provide a calorie-dense source of energy and are essential for absorption of fat-soluble vitamins A, D, E, and K. They also become storage energy for long duration physical activity, especially at lower intensities.
         (a) **Recommended daily intake:** 20-35% of daily calories. Ex: 76g-132g for 3400 calorie needs.
   c. **Micronutrients (Vitamins and Minerals):** Vitamins and minerals are essential for various body functions such as energy production and cellular processes. They are added to rations as needed to make sure soldiers meet daily intake requirements based on the Military Dietary Reference Intake (MDRI) values, prevent deficiencies and maximize performance during operations.
   d.
      (1) Key micronutrients:
         (a) Vitamins A, Bs, C, D, E, Folic Acid

a. Vitamin A: cell structure, hormone balance, immune support
b. Vitamin Bs: energy production and pathways, oxygen and nutrient transport, brain and nerve cell support
c. Vitamin C: collagen synthesis, immune support
d. Vitamin D: bone health, reduced injury and illness, muscle function
e. Vitamin E: reduction oxidative stress, protects cells, immune support

(b) Minerals: Calcium, Zinc, Iron, Phosphorus

a. Calcium: bone health and integrity, neuromuscular excitability, nerve impulses, cell membrane support
b. Zinc: assists in over 300 metabolic reactions, immune support
c. Iron: oxygen transport through blood
d. Phosphorus: bone mineralization

e. **Nutrition Fact Panel:** Using Nutrition Facts Panels on MRE components can help determine if one is consuming enough energy, carbs, protein, vitamins and minerals.

(1) See provided handout.

5. **MRE Macronutrient Examples:** Each ration component has a mixture of macronutrients (and micronutrients). To develop your field nutrition plan, you can categorize each item of an MRE based on the primary macronutrient it provides (carb, protein, and fat) and the approximate amount in grams, or understanding how to find this information on the nutrition label.
    a. **Carbohydrates:**
        (1) **30 grams or more**: fruit (spiced apples, dried fruit, enhanced applesauce), bread (snack bread, tortilla, filled bakery item), snack (cookie, pound cake, candy), pasta entrée (cheese tortellini, elbow macaroni), beverage (carb-fortified)
        (2) **20-30 grams**: cracker or side (oatmeal, potato au gratin), pasta entrée with meat (chili mac, spaghetti with beef sauce), beverage (cocoa, electrolyte)
        (3) **10-20 grams**: meat entrée containing starch/grain (beef or chicken stew), jam or jelly packets
    b. **Protein:**
        (1) **20 grams or more**: meat entrée (chicken chunks, tuna packet, BBQ beef)
        (2) **10-20 grams**: vegetarian entrée (cheese tortellini), snack (trail-mix), beverage (chocolate protein drink)

(3) **5-10 grams**: spread (peanut butter), meat snack

c. **Fats:**

(1) **10 grams or more**: snack (trail mix, cookie, pound cake), spread (peanut butter, cheese)

(2) **5-10 grams**: entrée (chicken noodle with veg, cheese tortellini), bread (snack bread, tortilla, filled bakery item)

(3) **1-4.9 grams**: fruit (spiced apples), entrée (chicken chunks), cracker, beverage (cappuccino, cocoa)

d. **Vitamins and Minerals:** The following ration components have been fortified (key nutrients added):

(1) Chocolate protein drink, fruit beverages, pouched fruits, cheese spread, peanut butter, crackers and snack bread, pudding, First Strike Bar.

(a) First Strike Bar is fortified with almost all micronutrients.

6. **Practical Exercise: Case Study**:

a. SSG Jonny Bravo. 25yr old Male. Ht. 70" Wt. 220lbs

(1) Not a fan of MREs. Concerned about the nutritional value of them. Instead, chooses to snack throughout field trainings.

(2) Lost 10lbs during recent 3-week field training. Complained of low energy during operations and returned to garrison with low back pain.

b. What nutrition advice would you give SSG Jonny Bravo as he prepares for a 3hr field activity (moderate intensity) in <u>extreme cold conditions.</u> Include fluid and hydration recommendations if desired from hydration class.

(1) 1hr <u>before</u> field training: What nutrients should be prioritized? Develop a pre-field-operation snack.

(2) During field training: Design a fueling strategy for during this operation.

(3) Post-field fueling: How soon after the operation should refueling occur? What nutrients should be prioritized post-field operation? Develop a post-field fueling regimen, as detailed as possible.

7. **Summary**

a. Operational Ration (OPRAT) Nutrition: OPRATs are created with a purpose. The measures taken to ensure optimal nutrition quality for the Warfighter during field training, operations, and missions are backed by science and research. The recipe and development process is continuously evolving to meet the demands and preferences of the Warfighter.

b. Performance Nutrition Reminders for the Field and Operational Environments

(1) **Never skip an opportunity to fuel up:** Food is essential for providing energy necessary to meet daily physical demands. Don't

neglect your meals and snacks as it may cause undesired weight loss and hinder your performance both physically and mentally.

(2) **Fuel Smart:** prioritize and plan ahead when possible. Learn your unique nutrition needs (daily energy needs, macronutrients, hydration, and micronutrients) and how they will change depending on the mission. Familiarize yourself with combat and operational rations. Combining this information and insight is the key to building a performance nutrition plan that will serve you both in and out of the field. Knowledge is power! There are many resources available to help further guide you.

(a) *Instructor* shares the resources below

OPTIONAL CHECK ON LEARNING

1. **Group Discussion:** Consider times when you deliberately skipped MREs or any operational ration and instead relied upon snacks. How did this impact performance as well as body composition and performance and health upon return to garrison?

AAR

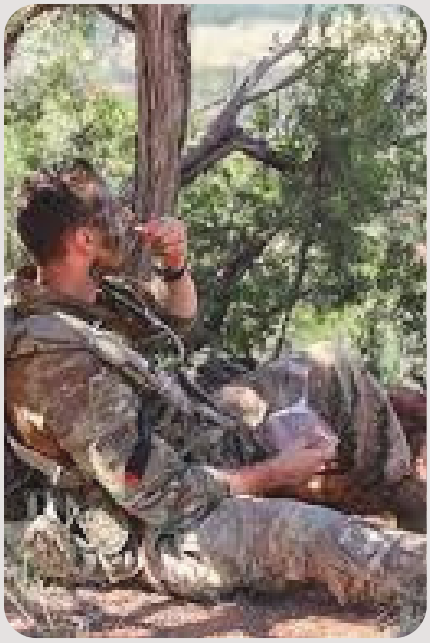
1. What was one new piece of information you learned from this training?
2. Was the activity practical and useful for improving nutrition habits in the field?
3. What resources are available for gaining nutrition information on operational rations to support optimal performance while on missions and during field exercises?
4. What barriers, if any, do you see in meeting your nutrition needs from operational rations after this lesson?

SUPPORTING RESOURCES

1. "Warfighter's Guide to Performance Nutrition & Operational Rations". US Army REDCOM: Combat Feeding Directorate. Warfighters-Guide-to-Performance-Nutrition-and-OpRats-1st-edition.pdf (army.mil)
2. Combat Rations Database (ComRaD). Human Performance Resources by CHAMP. hprc-online.org/nutrition/comrad
3. "Warfighter Nutrition Guide". Human Performance Resources by CHAMP. Chapter 11, 13.
4. AR 40-25, Nutrition and Menu Standards for Human Performance Optimization
5. FM 7-22 Chapter 8, 8-7 through 8-13
6. H2F Nutrition Team and Dietitians at Guthrie

FIELD NUTRITION

Fueling optimal operational performance using operational rations



NUTRITION QUALITY

MREs are scientifically designed to support the physical and mental performance of the Warfighter, providing appropriate calories, vitamins, and minerals to optimize mission outcomes.

1 MRE = 1300kcal: 51% carb, 13% protein, 36%fat & 1/3 MDRI vitamins/minerals

Personalized field nutrition can be developed by understanding individual nutrition needs and the nutrition contents of MREs and other operational rations.

NUTRITION FACT PANEL

Individual rations will have nutrition information for each ration component

Visit HPRC-ComRad for all MRE & individual ration menus & nutrition labels to build your nutrition plan ahead of time

Nutrition Facts
Chicken Burrito Bowl

Calories 264	Calories from Fat 40
	% Daily Value
Total Fat 4g	22%
Saturated Fat 1.0g	5%
Trans Fat 0.1g	
Cholesterol 52mg	17%
Sodium 893mg	37%
Potassium 487mg	14%
Total Carbohydrates 35g	12%
Dietary Fiber 4g	14%
Sugars 3g	
Protein 22g	

Vitamin A	9%	Vitamin C	32%
Calcium	8%	Iron	10%
Vitamin E	6%	Vitamin K	0%
Thiamin	0%	Riboflavin	0%
Folic Acid	0%	Vitamin B6	17%
Phosphorous	29%	Iodine	0%
Magnesium	13%	Zinc	9%
Selenium	32%		

ENERGY NEEDS

Meeting daily energy requirements is crucial for performing physical work, especially in extreme conditions, with heavy equipment loads, and on varied terrain.

RECOMMENDED DAILY INTAKE

*based on general guideline; will vary amongst individuals

Activity Level	Women	Men
Light (60m or less)	2100kcal	3000kcal
Moderate (60-120m)	2300kcal	3400kcal
Heavy (3-4hrs)	2700kcal	3700kcal
Very Heavy (4+hrs)	3000kcal	4700kcal

MACRONUTRIENTS

Essential energy-containing nutrients required in large quantities and in certain ratios to support performance goals & health.

Macronutrient	Daily Rec.	Ex: 200lb SM
CARBOHYDRATE	3g/1lb Wt	600g/day
PROTEIN	0.7g/1lb Wt	140g/day
FAT	20-35%kcal	76-132g/day

For more information: see *Warfighter's Guide to Performance Nutrition & Operational Rations & ComRad on HPRC.*
Other resources: H2F Nutrition Team and 10MTN Dietitians, *FM 7-22, Warfighter Nutrition Guide.*