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 needed to support the training objective.

OBJECTIVE

1. Soldiers will understand how to fuel in cold weather training and deployments to support performance and reduce cold weather injuries.

SCRIPT TO BE READ DIRECTLY

1. **Introduction to Nutrition for Missions in the Cold:** Soldiers participating in military training and deployments will often encounter cold stress that requires management for successful mission accomplishment. Excessive cold stress degrades physical performance capabilities, significantly impacts morale, and eventually causes cold weather injuries. Cold stress environments include not only exposure to extremely low temperatures (for example, mountainous regions, high altitudes), but also cold-wet exposures (for example, rain, immersion) in warmer ambient temperatures. The food and fluids you consume support the body's physical response to cold weather.

2. **Physical Responses to Cold Weather:**

   a. **Heat conservation:** When exposed to cold, humans exhibit vasoconstriction of blood flow in the limbs to conserve heat in the body. This transfers heat to the body's core and reduces the amount of blood flow to the limbs, causing a slight temperature drop in extremities.

   b. **Heat production:** Exposure to the cold can increase heat production in humans, which can offset heat loss. This is done voluntarily through increasing physical activity or involuntarily through shivering. Increased physical activity is more effective for heat production in the body than shivering.

   c. **Fluid Loss:** Exposure to the cold is well known for the increase in the urge to urinate due to the increased fluid concentration in the core of the body. In addition, the

thirst sensation is blunted in Soldiers. Soldiers have practical constraints on access to fluids and are less likely to feel thirsty. This can lead to dehydration and an increased risk of cold weather injuries.

d. **Fuel for your metabolism**: To support the body's physical response, as well as activities in the cold weather the body increases carbohydrate and fat metabolism for energy. The body uses carbohydrates 1.5 times more during rest and light activity in the cold weather compared to ambient weather. During high intensity exercise and activity in the cold, both carbohydrates and fat utilization can increase 3-fold. Protein use by the body remains the same. If a Soldier is not eating enough carbohydrates and fats, it will likely decrease physical and cognitive performance and reduce the body's ability to shiver to produce heat. Cold weather MREs and Modular Operational Ration Enhancements for cold weather (MORE) are made with more carbohydrates and fats than a regular MRE due to the body's physical response and increased energy needs.

3. **How to Eat for Cold Weather Missions:** The extra calories Soldier need each day during cold weather can usually be obtained by eating breakfast, lunch, dinner, and supplementing with frequent snacks throughout the day. If Soldiers are not eating their whole MRE, they will not get enough carbohydrates, fats, and energy in to perform optimally and reduce risk of injury. Reference comparison handout of MRE and MCW.

   a. **Meal, Cold Weather (MCW)** is an individual ration designed for use during missions in cold weather. The MCW contains dehydrated, precooked entrees and other low-moisture foods (granola, dried fruits, nuts, ramen noodle soup) that will not freeze. Each menu includes several beverages to encourage water consumption and prevent dehydration during cold-weather activities. Approximately 28–40 ounces of potable water are needed to rehydrate the ration components within each menu (this is more than a regular MRE). Each MCW menu provides an average of 1,600 calories, including 51 grams of protein, 227 grams of carbohydrates, and 58 grams of fat. Three MCWs (food for 24 hours) provide more than 4,500 calories, which is needed to meet the increased energy requirements when conducting operations in extreme cold-weather environments.

   b. **Kosher/Halel MRES** Soldiers that request MREs for religious reasons, should consume up to 2 complete Kosher/Halel MRES per meal to meet carbohydrate and fat requirements in cold weather. Soldier should also supplement with snacks throughout the day.

   c. **UGR/Warrior Restaurant:** Carbohydrates, protein, and color (fruits and vegetables) are the three main components of the performance plates. Fat requirements will vary based on activity level and amount of time exposed to the cold.

i. **Moderate Training Day**: This plate is made for strenuous activity and exercise. On a scale of 1 to 10, it's a 5 or 6. Soldiers need more energy to get through typical training days but not quite as much as on hard days, so you will add more carbohydrates to your plate. Fat levels are moderate. Moderate Plate Breakdown: Carbohydrate: 35%, Protein: 25%, Color: 40%, Fat: 1-2 tablespoons

ii. **Heavy Training Day:** This plate is made for high intensity exercise or activity in cold weather or long-lasting moderate training (3 to 4 hours or more). On a scale of 1-10, this is a 7 or higher. Soldiers need to load up on carbohydrates and fat to fuel the muscles and brain in order to train efficiently in cold weather. Heavy Plate Breakdown: Carbohydrate: 50%, Protein: 25%, Color: 25%, Fat: 2-3 tablespoons

d. **Fluids:** Fluid requirements during cold-weather training will vary according to physical activity levels, but for most people, about 3 to 6 quarts per day needs to be consumed to prevent dehydration. Soldiers can monitor their hydration status by noting the color and volume of their urine. Dark, low volume, and infrequent urination indicates the fluid consumption needs to be increased. Fluid intake is greatest at mealtime. Providing time for meals will ensure proper fluid intake. During mealtime, Soldiers can drink a variety of fluids (juice, tea, sports drink, coffee), as each will be equally effective in replacing body water. Offering warm beverages will also encourage fluid intake. Units should take precautions to avoid fluids freezing in their containers to ensure Soldiers have access to fluids.

4. **Summary**

a. Choose portion sizes to support your caloric needs in the cold weather. Focus on increase in fluids, carbohydrates, and fat to support physical responses to cold weather.

b. Consume a minimum of 3- 6 quarts of water per day when exposed to cold weather to decrease the risk of dehydration.

c. Skipping meals and poor nutrition increases the risk of cold weather injuries.

OPTIONAL CHECK ON LEARNING

1. **Group Discussion:** Discuss why taking enough calories is important to complete the mission and avoid cold weather injuries.

2. **Practical Exercise:** Order cold weather MREs for training missions in the cold. Develop a plan to have hot fluids available to increase fluid consumption.

AAR

1. What were the pros and cons of this training?

2. Do you understand the guidelines for eating and drinking in cold weather environments?

3. What, if any, barriers are there to increasing caloric intake through carbohydrates and fats during cold weather missions? How can they be overcome?

SUPPORTING RESOURCES

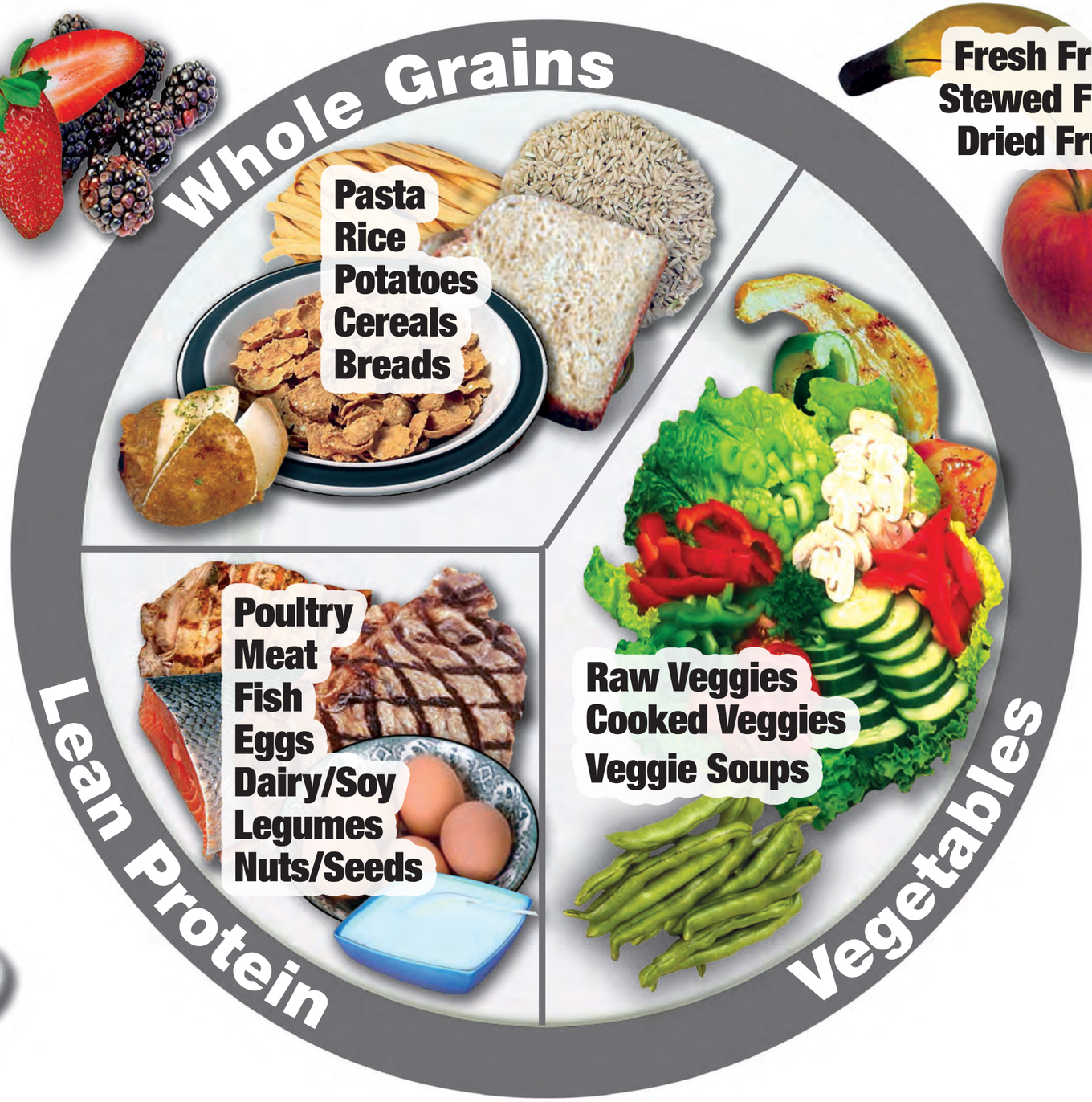
1. Warfighter Nutrition Guide Chapter 11, 13 Warfighter Nutrition Guide | HPRC (hprc-online.org)
2. TB MED 508 Prevention and management of cold weather injuries
3. H2F Nutrition Team and Dietitians at Guthrie

MODERATE TRAINING:

FATS

1-2 Tablespoon(s)

Avocado
Oils
Nuts
Seeds
Cheese
Butter



FLAVORS

Salt/Pepper
Herbs
Spices
Vinegar
Salsa
Mustard
Ketchup

HARD TRAINING:

FATS

2-3 Tablespoons

Avocado
Oils
Nuts
Seeds
Cheese
Butter

Grains

Pasta
Rice
Potatoes
Cereals
Breads

Lean Protein

Poultry
Meat
Fish
Eggs
Dairy/Soy
Legumes
Nuts/Seeds

Vegetables

Cooked Veggies
Veggie Soups
Raw Veggies

Fruit

Fresh Fruit
Stewed Fruit
Dried Fruit

Water

Dairy/Nondairy Beverages
Diluted Juice
Flavored Beverages

FLAVORS

Salt/Pepper
Herbs
Spices
Vinegar
Salsa
Mustard
Ketchup

Comparision of calories, carbohydrates, and fat between Meal Cold Weather and MRE

Meal Cold Weather, #3 Chili Macaroni with Beef, Freeze Dried

Type	Item	Calories	Carbs
Entree	Chili Macaroni with Beef, Freeze Dried	598	76g
Snack	Toasted Corn Kernels, Plain	260	42g
Bread/Crax	Crackers, Plain, TFF	183	29g
Spread	Cheese Spread, Cheddar, Plain, 1 ounce	114	2g
Candy	Pan Coated Chocolate Disks, Peanut	258	31g
Beverage	Coffee, Cappuccino, Irish Cream	122	23g
Candy	Chewing Gum, Xylitol	8	2g
Beverage	Coffee, Soluble, Freeze Dried	6	1g
Condiment	Creamer, Non-Dairy, Dry	22	2g
Condiment	Hot Sauce, Extra Hot 4x	1	0g
Condiment	Sugar	15	4g
	Total	1587	212g

Contains more calories, carbohydrates, and 63 grams of fat.

MRE, #10 Chili and Macaroni

Type	Item	Calories	Carbs
Entree	Chili and Macaroni	280	26g
Snack	Beef Snack, Teriyaki Stick	103	2g
Snack	Pound Cake, Lemon Poppy Seed TFF	296	41g
Bread/Crax	Crackers, Vegetable, TFF	164	26g
Spread	Cheese Spread, Cheddar with Jalapeno Peppers,	109	2g
Candy	Licorice Bite Size, Cherry	223	50g
Condiment	Red Pepper, Crushed	6	1g
Beverage	Beverage Powder, Carbohydrate Electrolyte	94	23g
Condiment	Chewing Gum, Xylitol	8	2g
Condiment	Coffee, Soluble, Freeze Dried	5	1g
Condiment	Creamer, Non0Dairy, Dry	21	2g
Condiment	Sugar	15	4g
	Total	1328	183g

Contains less calories, carbohydrates, and 53 grams of fat.