



21st Century Military Nutrition: Considerations & Approaches

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Overview

- ◆ Problem / Military Requirement
- ◆ Considerations for Developing Effective Approaches
- ◆ Concept to optimize Warrior Nutrition
- ◆ Prototype Research
- ◆ Conclusions





REQUIRED JFHP CAPABILITY: *Provide a Healthy and Fit Force*

The ability to provide and enhance a healthy and fit force throughout the continuum *from accession to veteran* includes:

- ◆ optimizing health/fitness of peacetime forces
- ◆ maintaining health/fitness of deployed forces
- ◆ Ensuring physical and mental health [reset] of redeployed SMs

Joint Force Health Protection Concept of Operations

v 0.9, July 07

Developed by OSD (Health Affairs)

Enabler:

***Nutrition programs to promote eating behavior
by Warriors that establish and maintain a
health & fitness over a lifetime***





**Nutrition
Science For
Force Health
Protection**

**USARIEM Military
Nutrition Research
Program**

**Nutritional Optimization
of
Health & Performance**

- macro/micro-nutrient rqmts
- supplements & bioactive foods
- meal timing, feeding plans, menus, nutrient delivery systems

**Operational Ration
Testing & Evaluation**

- nutrient composition
- physiological
- cognitive
- sensory

**Healthy Weight
Management**

- risk factors & behaviors
- interventions





Feeding the Force in the “Real World”

Operational Rations

Public /
Private Dining

Garrison Dining

Group
Rations

Individual
Rations

Unconstrained

Constrained



Meal, Ready to Eat
Meal, Cold Weather/LRP



UGR-B: Canned & Dehydrated Foods
UGR-H&S: Heat and serve ration
UGR-A: Heat & Serve+ Fresh, Perishable foods





US Armed Forces - a Large, Diverse Population

One Size Doesn't Fit All!



(~15%)

**Total Armed
Services**

1,417,157

Army

525,482

Navy

331,383

Marine Corps

190,651

Air Force

327,589

DoD Total

1,375,105

Coast Guard

42,052





“It’s not nutrition until it’s eaten” COL Dave Schnakenberg

◆ Nutrient Factors

- Macronutrients
- Micronutrients
- Bioactive Components

◆ Non-Nutrient Factors

- Food associated
- Individual associated
- Environmental

Nutritional Value

**Food Preferences
&
Consumption**

**Dietary
Quality**

*Health Is not often the chief
motive for young men to
change eating behavior –*

*(vigor, appearance
performance)*

Meiselman & MacFie, 1996





Factors Determining Food Consumption

◆ Food

- Portion size
- Acceptances, Liking, Preferences*
- Perceptions (appearance, labels, packaging, origins)
- Presentation (temperature, utensils, dishes)
- Variety, monotony, sensory specific satiety

◆ Individual

- Age, sex, cultural influences
- Expectations* (marketing, education influence)
- Attitudes (neophobia, involvement, dietary restraint)
- Commensality (non-obese vs. obese)
- Food and Mood/Emotion

◆ Environment

- Location
- Time of Day (meal appropriateness, snacks, presentation)
- Choice
- Ambiance (comfort)
- Convenience & access (effort, time)
- Price, value





Promoting Healthy Eating Behavior - Civilian Cafeteria Research

◆ Nutrient Content Manipulation of ad lib diet (minimal effect?)

- Jayhawk Observed Eating Trial (Donnelly et al., Obesity. 2008)
 - ✗ In 305 sedentary normal & overweight men & women, reduced fat diets only effective in weight loss when energy intake was reduced

◆ Ad lib food choice can be manipulated (for the better?)

- Harvard SPH Cafeteria Study (Michels, et al., J Am Coll Nutr. 2008)
 - ✗ Educational displays
 - ✗ Price subsidies for “healthy” selections
- NIH-funded Cafeteria Study (Lowe, et. al., unpublished ongoing project)
 - ✗ Detailed food labeling
 - ✗ Greater number “healthy” selections
 - ✗ Price subsidies for reduced energy density items
- Yale NSLP Study (Schwartz, Int. J. Behav. Nutr. Phys. Act. 2007)
 - ✗ Verbal prompts by food servers to encourage fruit selection
- “Sargent Choice” at Boston University – anecdotal reports
 - ✗ Logo label of line of “healthy” food choices throughout DFACs

Why are french fries & hotdogs cheaper than salad?





Promoting Healthy Eating Behavior- The 21st Century Warrior Nutrition Center Concept

◆ Evolve garrison DFACs into state-of-art centers

Its not just slinging hash

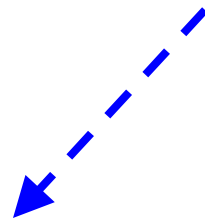
- Military Dietitian Directed
- Provide and/or promote consumption of the most healthy diet tailored for Warriors, their families and the garrison community.
- Apply best practices in nutrition science, nutrition education, nutrition therapy, counseling and intervention.
- Holistic community/environmental support for changing behavior to optimize health/fitness.
- Supports needs and goals of garrison MTFs, units, schools, and community.





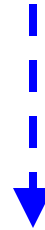
Promoting Healthy Eating Behaviors

The 21st Century Warrior Nutrition Center



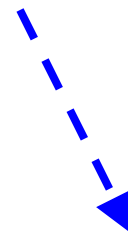
Cafeteria Interventions

- nutritional content
- promote/optimize healthy food choice



Education / Resources

support for Warriors,
their family & entire
garrison community



Evolve DFACs

“focal point” for
nutrition care,
education & health
promotion at each
base





Modifying Serving Practices in Military DFACs to Enhance Healthy Nutrition

◆ 10 DFACs that serve 300 Warriors per meal

- Cluster (group) randomized controlled trials, partial cross-over
 - ✧ Intervention (n=5) - month 1-12
 - ✧ Control (n=5) - no change month 1-6, "Fresh Start" month 7-12

◆ Intervention

- Dietary Guidelines for Americans 2005 (fresh fruits, vegetables, whole-grains, fiber, reduced fat/sugar content alternatives, lean cooking methods).
- Presentation, placement changes in food service
- Nutrition labeling and education materials posted

◆ Measurements

- **Ad lib** food selections & intake, demographics & satisfaction ratings
- Lunch (225 volunteers) at months 0 (baseline), 6 & 12.
- Digital photography quantitative & qualitative nutritional assessment of food selected and consumed.
- Outcomes
 - ✧ Primary - % kilocalories intake from fat
 - ✧ Secondary - % carbohydrate and protein intake, food selection, fruit & vegetable servings, total kilocalories food intake.





21st Century Research Challenge



**Nutritional
Optimization**



**Evolution of DFACs
Validation of
Efficacious Strategies**

**Modification of Warrior
Eating Behavior for Health
& Performance**

**Integrated & Holistic Support
for Warriors to sustain healthy lifestyle**





Questions?

21st Century Warrior Nutrition programs to establish and maintain optimal fitness are likely to be most effective by promoting long-term change in Warrior eating behavior within a holistic, environmental approach consistent with healthy lifestyle.

Evolving current garrison DFACs into state-of-the-art nutrition centers, under direction of military dietitians offer a means of integrating nutrition science, medical care, fitness training and wellness promotion throughout the Warrior community.

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