21st Century Military Nutrition: Considerations & Approaches

ANDREW J. YOUNG, Ph.D.

Chief, Military Nutrition Division
U.S. Army Research Institute of Environmental Medicine, Natick, MA

508-233-5141
andrew.j.young@us.army.mil
**Report Title:** 21st Century Military Nutrition: Considerations & Approaches

**Performing Organization:**
Military Nutrition Division U.S. Army Research Institute of Environmental Medicine, Natick, MA

**Distribution/Availability Statement:**
Approved for public release, distribution unlimited

**Supplementary Notes:**
The original document contains color images.

**Security Classification:**
- a. Report: unclassified
- b. Abstract: unclassified
- c. This Page: unclassified

**Limitation of Abstract:** UU

**Number of Pages:** 14
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
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

Nutrition Science For Force Health Protection
Feeding the Force in the “Real World”

Operational Rations

<table>
<thead>
<tr>
<th>Public / Private Dining</th>
<th>Garrison Dining</th>
<th>Group Rations</th>
<th>Individual Rations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconstrained</td>
<td></td>
<td></td>
<td>Constrained</td>
</tr>
</tbody>
</table>

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

Meal, Ready to Eat
Meal, Cold Weather/ LRP

---

**Warfighter Nutrition: Advanced Technologies & Opportunities**
USUHS, Bethesda, Md 15-16 Jul 08
### US Armed Forces - a Large, Diverse Population

**One Size Doesn’t Fit All!**

<table>
<thead>
<tr>
<th>Armed Services</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Armed Services</td>
<td>1,417,157</td>
</tr>
<tr>
<td>Army</td>
<td>525,482</td>
</tr>
<tr>
<td>Navy</td>
<td>331,383</td>
</tr>
<tr>
<td>Marine Corps</td>
<td>190,651</td>
</tr>
<tr>
<td>Air Force</td>
<td>327,589</td>
</tr>
<tr>
<td>DoD Total</td>
<td>1,375,105</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>42,052</td>
</tr>
</tbody>
</table>

(\(~15\%)\)
“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

Dietary Quality

Food Preferences & Consumption

Meiselman & MacFie, 1996

Health is not often the chief motive for young men to change eating behavior – (vigor, appearance performance)
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

Meiselman & MacFie, 1996
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?)
    ✗ 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
    ✗ 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?
Evolve garrison DFACs into state-of-art centers

*It's 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.

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Army or the Department of Defense.