



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 Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 JUL 2008		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE 21st Century Military Nutrition: Considerations & Approaches				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Military Nutrition Division U.S. Army Research Institute of Environmental Medicine, Natick, MA				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 14	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



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



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!



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

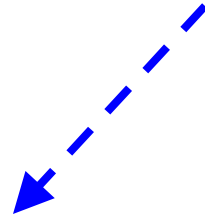
- Military Dietitian Directed
- Provide and/or promote consumption of the most healthy diet tailored for Warriors, their families and the garrison community.
- Apply best practices in nutrition science, nutrition education, nutrition therapy, counseling and intervention.
- Holistic community/environmental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





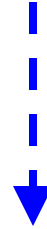
Promoting Healthy Eating Behaviors

The 21st Century Warrior Nutrition Center



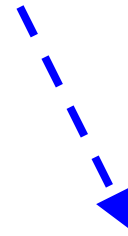
Cafeteria Interventions

- 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.

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.

