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TITLE: Nutrient Requirements, Body Composition, and Health of Military Women

PRINCIPAL INVESTIGATOR: Rebecca B. Costello, Ph.D.

Bernadette M. Marriott, Ph.D.

CONTRACTING ORGANIZATION: National Academy of Sciences

Institute of Medicine Washington, DC 20418

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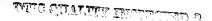
U.S. Army Medical Research and Materiel Command

Fort Detrick, Frederick, MD 21702-5012

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body composition and he	ealth concerns for military v	vomen. The faces:	quirements and related
personnel with particular	r attention to concerns of nu	triant inteller cours will	i be on active duty
activity and weight evel	ing during round disting and	urient intake, weight	standards, type of
Rody Composition Num	ling during reproductive and	postreproductive year	ars. The Committee on
and a 2 day weeker a to	rition, and Health of Militar	y Women (BCNH) w	ill hold five meetings
has been believed.	address and evaluate these	issues. To date, an in	troductory meeting
has been held to discuss	and develop the agenda for	a Tri-Services worksl	hop that is scheduled
10r September 9–10, 199	6. I wo reports will be prod	uced: a preliminary r	enort with a summary
of the workshop proceed	lings and a literature review	to be delivered in Sni	ring 1997 and a final
report with conclusions a	and recommendations to be	delivered in Fall 1993	7 These reports will
respond to the need for n	nore specific nutrient and we	eight guidance for we	men in active
military settings and add	itionally will provide releva	nt guidance for wome	en in public sofety
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FOREWORD

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In conducting research using animals, the investigator(s) adhered to the "Guide for the Care and Use of Laboratory Animals," prepared by the Committee on Care and use of Laboratory Animals of the Institute of Laboratory Resources, national Research Council (NIH Publication No. 86-23, Revised 1985).
For the protection of human subjects, the investigator(s) adhered to policies of applicable Federal Law 45 CFR 46.
In conducting research utilizing recombinant DNA technology, the investigator(s) adhered to current guidelines promulgated by the National Institutes of Health.
In the conduct of research utilizing recombinant DNA, the investigator(s) adhered to the NIH Guidelines for Research Involving Recombinant DNA Molecules.
In the conduct of research involving hazardous organisms, the investigator(s) adhered to the CDC-NIH Guide for Biosafety in Microbiological and Biomedical Laboratories.
Rebecca & Ostella 9/5/96 PI - Signature Date

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ANNUAL REPORT

The Committee on Body Composition, Nutrition, and Health of Military Women (BCNH) was created as an outgrowth of the ongoing activities of the Committee on Military Nutrition Research (CMNR). In a recent report, the CMNR called specific attention to dietary issues for women in the military (IOM, 1991a). In addition, discrepancy between the retention standards for men and women across the services was noted in another CMNR report (IOM, 1992) and in the series of Food and Nutrition Board (FNB) reports on nutrition for women during pregnancy and lactation (IOM 1990, 1991b). These findings prompted the FNB to form a subcommittee of the CMNR to perform a more in-depth review of nutrition and body composition issues in military women. This subcommittee consists of 10 individuals with expertise in nutritional epidemiology, clinical nutrition and health issues, behavioral and social psychology, human performance physiology, survey design and analysis, nutrition during pregnancy/lactation, and body composition. In addition, familiarity with the military and/or with military nutrition science is a key factor. A roster of these members is in Appendix A.

Through a 2-day workshop, extensive literature review, design of a survey questionnaire, and series of meetings, the subcommittee is addressing the following questions: (1) What are the energy requirements of women in military jobs and during field training exercises compared to women in public safety occupations (such as law enforcement officers, fire fighters, etc., where weight and performance standards are maintained and working conditions often necessitate high levels of physical performance under stressful conditions)? (2) What is a reasonable period of time for return-to-duty fitness and body composition standards for postpartum active duty women? (3) Is there an appropriate female body fat standard that can be reasonably maintained through regular exercise and energy balance that will not compromise fitness or readiness?

The subcommittee held its introductory meeting (see introductory meeting agenda, Appendix B) in April 1996 to clarify its assignment of tasks and to plan the workshop entitled "Assessing Readiness in Military Women: The Relationship to Nutrition." At this meeting, a Tri-Service liaison panel attended as a resource group of military researchers and policy makers to assist the subcommittee (see liaison panel roster, Appendix C). LTC Karl E. Friedl, U.S. Army contracting officer representative, presented some background information on health and fitness policy and readiness issues. Additionally, he and several other service representatives presented an overview of current practices amongst the services as they relate to the active duty woman. The content of the proposed workshop was discussed with the liaison panel; subsequently, the staff met with LTC Friedl and drafted a proposed agenda.

The workshop is scheduled for September 9–10, 1996, with presentations being largely by military nutrition researchers, civilians performing research for the military, and noted scientists in academia (see workshop agenda, Appendix D). It is anticipated that as a result of the workshop, the subcommittee will be able to better identify the "characteristic

military woman," as well as identify weight and fitness standards that are appropriate to her role. In addition, as a result of the workshop and literature review, the subcommittee will identify gaps in the existing database to enable such information to be captured by the survey that the subcommittee subsequently will design.

Four additional meetings will be held (see timeline, Appendix E) for discussions and drafting of the subcommittee's reports. The workshop proceedings and an extensive literature review are scheduled to be delivered in Spring 1997 and a final report shall be delivered no later than Fall 1997.

While the subcommittee was delayed in being activated due to other priority requests by the military sponsor for the parent committee (CMNR), it is anticipated that the BCNH subcommittee will meet its contractual deadlines as previously outlined.

REFERENCES

IOM (Institute of Medicine)

- Nutrition During Pregnancy. Part I, Weight Gain. Part II, Nutrient Supplements. A report of the Subcommittee on Nutritional Status and Weight Gain During Pregnancy, Subcommittee on Dietary Intake and Nutrient Supplements During Pregnancy, Committee on Nutritional Status During Pregnancy and Lactation, Food and Nutrition Board. Washington, D.C.: National Academy Press.
- 1991a *Military Nutrition Initiatives*. A report of the Committee on Military Nutrition, Food and Nutrition Board. Washington, D.C.: Food and Nutrition Board.
- 1991b Nutrition During Lactation. A report of the Subcommittee on Nutrition and Lactation, Committee on Nutritional Status During Pregnancy and Lactation, Food and Nutrition Board. Washington, D.C.: National Academy Press.
- 1992 Body Composition and Physical Performance, Applications for the Military Services, B.M. Marriott and J. Grumstrup-Scott, eds. A report of the Committee on Military Nutrition Research, Food and Nutrition Board.

APPENDIX A

BCNH Roster of Members

Barbara O. Schneeman, Ph.D.

(Chair)

Dean, College of Agricultural and Environmental Sciences University of California Davis, CA

Robert O. Nesheim, Ph.D.

(Vice Chair)

Salinas, CA

Nancy F. Butte, Ph.D., M.P.H., R.D.

Associate Professor of Pediatrics Children's Nutrition Research Center Baylor College of Medicine Houston, TX

Joan M. Conway, Ph.D., R.D.

Research Chemist, Diet and Human Performance Laboratory USDA-ARS Beltsville Human Nutrition Research Center Beltsville, MD

Steven B. Heymsfield, M.D.

Director, Human Body Composition
Laboratory and Weight Control Unit
Deputy Director, Obesity Research
Center
St. Luke's-Roosevelt Hospital Center
New York, NY

Anne Looker, Ph.D., R.D.

Senior Research Epidemiologist National Center for Health Statistics Division of Health Examination Statistics Hyattsville, MD

Mary Z. Mays, Ph.D.

Director, Eagle Creek Research Services San Antonio, TX

Maritza Rubio-Stipec, M.S.

Professor, Department of Economics University of Puerto Rico, San Juan, PR Harvard School of Public Health, Cambridge, MA

CMNR Liaison

Gail E. Butterfield, Ph.D., R.D.

Director, Nutrition Studies, Palo Alto Veterans Affairs Health Care System Visiting Associate Professor, Program in Human Biology, Stanford University Palo Alto, CA

FNB Liaison

Janet C. King, Ph.D. (IOM)

Director, USDA Western Human Nutrition Research Center, and Professor, University of California, Berkeley San Francisco, CA

IOM Staff

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Office Address

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APPENDIX B

BCNH Introductory Meeting Agenda

April 12–13, 1996 Cecil and Ida Green Building Room 116 2001 Wisconsin Avenue, N.W. Washington, D.C. 20007

AGENDA

Friday, April 12, 1996		
8:00 AM	Continental breakfast available, Room 116	
8:30–2:00 PM	Executive Session	
8:30–8:45 AM	Welcome, Review of Agenda	
8:45–9:15 AM	Orientation to the NAS, IOM, FNB	
9:15-10:00 AM	Introductions and Discussion of Composition and Balance Factors (Bias) – Allison Yates, Director, FNB	
10:00–10:20 AM	Break	
10:20–11:50 AM	Overview of Study Charge to the Committee	
12:00 AM -1:00 PM	Lunch at Green Building	
1:00–2:00 PM	Discussion of Charge, continued	
2:00–2:20 PM	Break	
2:30–5:30 PM	Committee Discussion with Sponsor and Liaison Panel LTC Karl Friedl, Staff Officer, USAMRMC Liaison Panel Members	
5:30–6:00 PM	Reception at the Green Building, South Prefunction Area Committee members, Liaison Panel, sponsor, staff	

6:00 PM

Dinner at the Green Building, Room 110 Committee members, staff

Saturday, April 13, 1996

8:00 AM	Continental breakfast available
8:30–10:00 AM	Executive session Identification of subcommittee tasks and needs
10:00–10:15 AM	Break
10:15–12:00 Noon	Committee Discussion with Sponsor and Liaison Panel Planning of Workshop and other tasks
12:00–1:00 PM	Lunch at Green Building
1:00-3:00	Executive Session - Subcommittee Breakouts Discussion of subcommittee activities and plans
3:00-4:00	Further discussion of charge, Wrap-up

APPENDIX C

BCNH Roster of Liaison Panel Members

Carol J. Baker-Fulco, M.S., R.D.

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

LTC Alana Cline, Ph.D., R.D.

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

LTC Dale E. Hill, M.H.A., R.D.

Nutrition Staff Officer, Office of the Surgeon General Department of the Army Falls Church, VA

James A. Hodgdon, Ph.D.

Head, Human Performance Department Naval Health Research Center San Diego, CA

LT Leslie Cox

Bureau of Naval Personnel Washington, DC

MAJ Beth Foley, B.S.N., M.S., R.N.

Health Promotion Policy Officer Department of the Army Washington, DC

MAJ Joanne Spahn, M.A.

Deputy Director of Nutritional Medicine Services, U.S. Air Force Andrews AFB, MD

CDR Faythe M. Weber, M.S., R.D.

Commander, Medical Service Corps, U.S. Navy Bureau Medicine and Surgery Washington, DC

Contracting Officer Representative LTC Karl E. Friedl, Ph.D.

Staff Officer and Research Physiologist, Army Operational Medicine Research Program HQ, U.S. Army Medical Research and Materiel Command Fort Detrick, MD

IOM Staff

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APPENDIX D

BCNH Workshop Agenda

ASSESSING READINESS IN MILITARY WOMEN: THE RELATIONSHIP TO NUTRITION

September 9–10, 1996 Arnold and Mabel Beckman Center National Academies of Science and Engineering Irvine, California

Monday, S	September	9.	1996
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Beckman Center Lecture Room

7:30 am

Breakfast available in the refectory

I. WELCOME AND INTRODUCTION TO THE TOPIC

8:30 am-8:45 am

Welcome and Introductions

Barbara O. Schneeman, Chair, Committee on Body Composition, Nutrition

and Health of Military Women

Presentations are 15 minutes in length followed by a 5 minute discussion period

8:45 am-9:05 am Military Readiness of Women: An Overview from the Command Perspective CDR Susan B. Herrold, NC, USN, BUMED, Washington, DC

9:05 am-9:25 am Profile of the Military Woman

Naomi Verdugo, U.S. Army Office of the Deputy Chief of Staff for

Personnel, Washington, DC

9:25 am-9:45 am Health and Nutrition Profile of Women in the Navy

Laurel L. Hourani, Naval Health Research Center, San Diego, CA

9:45 am-10:00 am Break

10:00 am-10:20 am Characteristics of Female Midshipmen: 1992 to 1996

David W. Armstrong, III (tentative), Henry F. Jackson Foundation,,

Bethesda, MD

10:20 am-10:40 am Health, Fitness, and Nutrition Among Military Women and Men

Robert M. Bray, Research Triangle Institute, Research Triangle Park, NC

10:40 am-11:00 am Disordered Eating Among Women in the Armed Forces

Tracey Sbrocco, Uniformed Services University of the Health Sciences,

Bethesda, MD

11:00 am-11:40 am Part I Discussion

II. BODY COMPOSITION AND FITNESS

11:40 am-12:00 pm	Body Composition and Physical Performance of Women James A. Hodgdon, Naval Health Research Center, San Diego, CA
12:00 pm-12:20 pm	Methodological Problems in the Assessment of Women's Body Composition by the Military: Identification of Valid and Reliable Methods for Field Use LTC Karl E. Friedl, USA, USAMRMC, Ft. Detrick, MD
12:20 pm-1:30 pm	Lunch
1:30 pm-1:50 pm	Ethnic Differences in Body Composition: Application to Active Military Women Lisa Stolarczyk, University of New Mexico, Albuquerque
1:50 pm-2:10 pm	Cross-Sectional Profile of Body Composition Among Active-Duty Navy and Marine Corps Personnel Wendy Graham, Naval Health Research Center, San Diego, CA
2:10 pm-2:30 pm	Accession Weight Standards: Inconsistencies and Gender Bias CDR Wayne Z. McBride, MC, USN, Uniformed Services University of the Health Sciences, Bethesda, MD
2:30 pm-3:10 pm	Part II Discussion
3:10 pm-3:30 pm	Break
III. FITNESS ASSESSM	ENT
3:30 pm-3:50 pm	Assessment of Fitness in the Army: Current Approaches and Standards COL Jeanne Picariello, USA, U.S. Army Physical Fitness School, Ft. Benning, GA
3:50 pm-4:10 pm	Assessment of Fitness in the Navy: Current Approaches and Standards LCDR René Hernandez, USN, BUPERS, Washington, DC
4:10 pm-4:30 pm	Assessment of Fitness in the Air Force: Evaluation of the Cycle Ergometry Program MAJ Sylvia C. Friedman, USAF, Office of the Surgeon General, Bolling AFB, Washington, DC
4:30 pm-4:50 pm	Effect of Alterations in Excess Weight on the Physical Performance of Men and Women

4:50 pm-5:30 pm

Part III Discussion

5:30 pm

Closing Remarks

Barbara O. Schneeman

Reception and dinner on the Beckman Center Terrace

7:00 pm-7:30 pm

After-Dinner Presentation in the Beckman Center Lecture Room Zinc and Iron Nutriture: Neuropsychological Function of Women

Harold H. Sandstead, University of Texas Medical Branch, Galveston, TX

Tuesday, September 10, 1996

Beckman Center Lecture Room

7:30 am

Breakfast available in the refectory

IV. HEALTH OUTCOMES OF WEIGHT CONTROL BEHAVIORS: THE IMPACT ON MILITARY READINESS

8:30 am-8:40 am

Opening Remarks

Barbara O. Schneeman

8:40 am-9:00 am

Perspectives on Nutritional Issues of Army Women

LTC Nancy King, USA, Dwight David Eisenhower Army Medical Center,

Fort Gordon, GA

9:00 am-9:20 am

Eating Practices Among Military Personnel: A Review

Carol J. Baker-Fulco, USARIEM, Natick, MA

9:20 am-9:40 am

Gender Differences in Food Ration Preferences and Consumption Among

Military Personnel

Edward Hirsch, NRDEC, Natick, MA

9:40 am-10:00 am

Health Consequences and Assessment of Disordered Eating and Weight

Control Behaviors

David M. Garner, Toledo Center for Eating Disorders, Bowling Green

State University, Toledo, OH

10:00 am-10:20 am

Part IV (A) Discussion

10:20 am-10:40 am

Break

10:40 am-11:00 am

Calcium Needs of Pre-Menopausal Women

Richard J. Wood, USDA Human Nutrition Research Center, Boston, MA

The Female Athlete Triad: Effects on the Skeleton 11:00 am-11:20 am Michelle P. Warren, St. Luke's-Roosevelt Hospital and Columbia College of Physicians and Surgeons, New York Impact of Integrated Training on the Incidence of Stress Fractures and Other 11:20 am-11:40 am Injuries in Women COL Bruce Jones, USA, CHPPM, Aberdeen Proving Grounds, MD 11:40 am-12:00 pm Part IV (B) Discussion 12:00 pm-1:00 pm Lunch V. BODY COMPOSITION AND PERFORMANCE ISSUES DURING PREGNANCY AND THE POSTPARTUM **PERIOD** 1:00 pm-1:20 pm Clinical Impact of U.S. Army Policies and Procedures on Pregnancy, the Postpartum Period, and Body Composition: Twenty Years of Experience Paul N. Smith, COL MC USA (Ret), Tacoma, WA The Impact of Pregnancy Weight Restriction, Postpartum Exercise and 1:20 pm-1:40 pm Weight Loss on Lactation Megan McCrory, University of California, Davis 1:40 pm-2:00 pm Pregnancy Among Navy Women CDR Michael J. Hughey, MC USNR, Northwestern University School of Medicine, Wilmette, IL Postpartum Fitness 2:00 pm-2:20 pm COL Joseph Dettori (tentative), USAF, Madigan AFB, Tacoma, WA 2:20 pm-2:40 pm The Impact of Graded Physical Activity Programs on Pregnancy Outcome E. F. Magann (tentative), Balboa Naval Health Center, San Diego, CA 2:40 pm-3:20 pm Part V Discussion 3:20 pm Closing Remarks

Barbara O. Schneeman

APPENDIX E

BCNH Timeline

Task Date(s) September 9-11, 1996 Workshop and Second Meeting (2½ days) First day through second afternoon: Committee, Liaison Panel, Speakers, and Guests Presentations by liaison panel members and other military nutrition researchers Second afternoon: Committee and Liaison Panel Draft procedures for literature review Third morning: Committee Draft outline of workshop summary, literature review, survey design and assign tasks Receive assignments from Committee and draft Mid September-Mid October 1996 preliminary report October 1996 Compile literature review Discuss survey design with Committee and Liaison Panel October 1996 Assemble review panel for preliminary and final reports October 1996 Third Meeting (1½ days) Mid November 1996 Discuss preliminary report (workshop proceedings and literature review) Committee review of and sign-off on preliminary report December-January 1997 Institute of Medicine review of and sign-off on preliminary report January-February 1997 Late January 1997 Fourth Meeting (2½ days) Draft conceptual approach to define military woman Outline tasks on nutrient intake and dietary issues Transmit preliminary report March 1997

Review draft survey, military women concept, and nutrient intakes

Draft conclusions and recommendations for final report

Mid April 1997

Fifth Meeting

Committee review of final report draft

May 1997

Sixth/Final Meeting

Early June 1997

Review final report draft Finalize conclusions and recommendations

Committee review of and sign-off on final report

June-July 1997

Institute of Medicine review of and sign-off on final report

August-September 1997

Transmit final report

September 1997