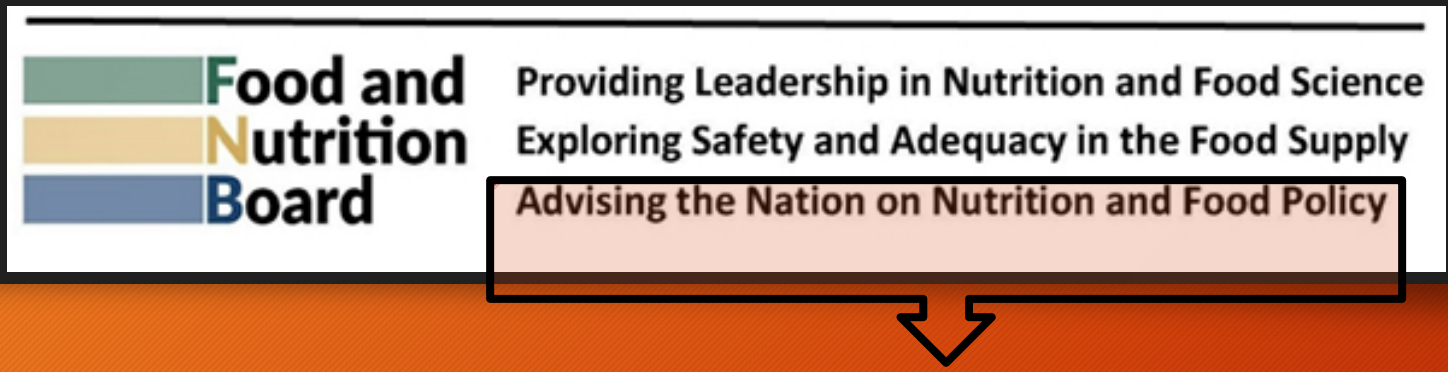
Committee on Military Nutrition Research (CMNR)

NATIONAL ACADEMY OF SCIENCES, INSTITUTE OF MEDICINE,
FOOD AND NUTRITION BOARD

CMNR Role in DoD Ration Development and National Defense over the past 30 years 1982-2012

Wayne Askew, PhD
COL USA (Ret)
Professor Emeritus
University of Utah
Department of Nutrition and Integrative Physiology

What is the Committee on Military Nutrition Research (CMNR)?



The CMNR is **an appointed military nutrition advisory subcommittee of the Food and Nutrition Board**

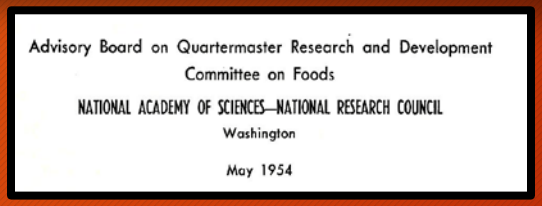
Formed in 1982 in response to DoD request to provide authoritative and focused expert advice:

1) *On nutritional factors that may critically influence the physical and mental performance of military personnel under all environmental extremes.*

2) On research that would remedy deficiencies concerning military field feeding and combat ration development.

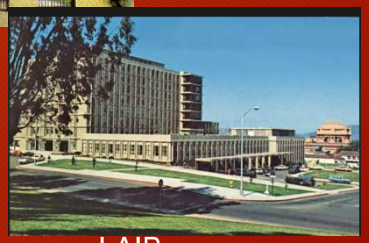
What Historical Sources, Military Nutrition Expertise and Advice Existed Prior to the CMNR? 1950-1980

- Advisory Committees

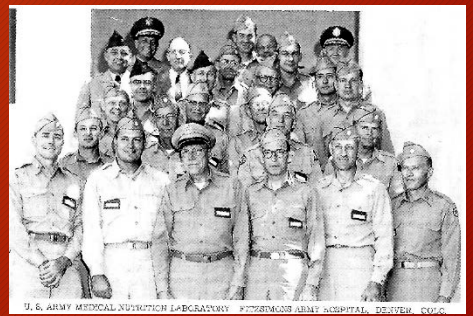

Advisory Board on Quartermaster Research and Development
Committee on Foods
NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL
Washington
May 1954

- In House Government Nutrition Research Laboratories

USAMRNL


LAIR

- US Army Nutrition Professional Reserve Officers



Nutrition Reserve Officers

Post WWII Civilian/Soldier Nutrition Officer Reservists Provided a Wide Range of Nutritional Expertise

Food and Nutrition Board

Army Reserve Officers at USAMRNL 1957

Gerald Coombs
WWII Nutrition Officer
Director Grand Forks
(USDA, ARS)

Lavell Henderson
University of Minnesota
WWII Nutrition Officer
FNB, NAS, past
President, AIN

Kenneth Harshbarger
Professor of Nutrition
University of Illinois
World War II
Nutrition Officer

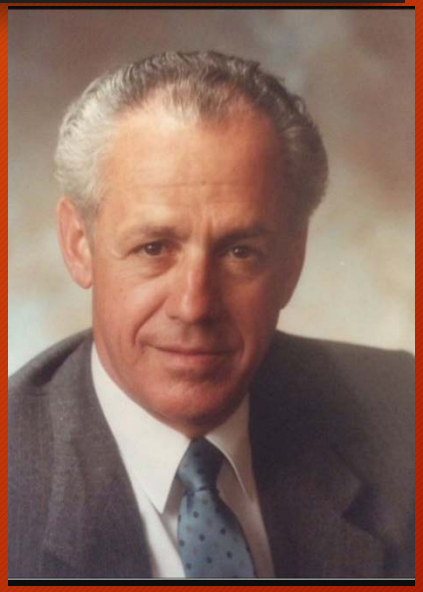
U. S. ARMY MEDICAL NUTRITION LABORATORY FITZSIMONS ARMY HOSPITAL, DENVER, COLO.

1957 USAR OFFICER ACTIVE DUTY TRAINING PROGRAM 11 AUGUST to 25 AUGUST

FRONT ROW: Lt Col Moore Burns Lt Col K.E. Harshbarger Col J. S. Butts Lt Col E.M. Parrott Lt Col L. M. Henderson Lt Col Albert Booth
SECOND ROW: Lt Col H. D. Slade Lt Col T. W. Stearns Lt Col Raymond Schroeder Lt Col Joseph Scott
THIRD ROW: Major T H Bell Major W. B. Cook Major R. W. Engel Lt Col R. W. McVicar
FOURTH ROW: Capt. Frank Streightoff Major A. E. Light Major P. H. Weswig Captain L.R. Arrington
FIFTH ROW: Col R.C. Hullinghorst Dr. T.E. Friedemann Major A. C. Wolfe Major G. F. Combs
SIXTH ROW: Lt Col C. J. Koehn Major C. E. French Captain E. W. Hartshcok Lt Col L. M. Hursh

Served at the U.S. Army Medical Research & Nutrition Laboratory
Later, a member of the Food and Nutrition Board & Committee on Military Nutrition Research

Gilbert Leveille, Ph.D. 1960-1962
1LT, USA USAMRNL
Medical Service Corps Officer
USARMNL, Denver, CO



Gilbert Leveille, Ph.D.
Member the National Academy of Sciences and Food and Nutrition Board.
Subsequently a Member CMNR 1990-1996

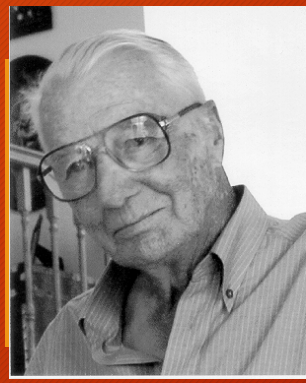
Military Nutrition Research Laboratories 1950-1980

- Due to DoD budget cuts and congressional directed laboratory consolidation decisions, by 1980 the US Army had no in-house nutrition research capability.
- Nutrition Research responsibilities were subsequently delegated to the USDA

However, it did not did not prove "feasible" for USDA to take on the added task of Military Nutrition Research

Reconsideration of DoD Nutrition Research

1981 DoD request:
NAS/NRC Advisory Board be formed
to conduct an Evaluation of
the DoD Food RDT&E Program

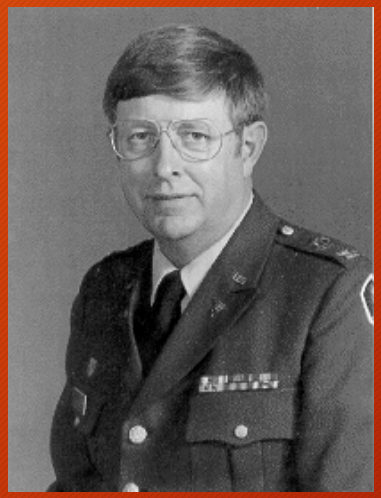


- Panel Chaired by Dr. Bob Nesheim recommended that DoD conduct nutrition research that cannot be readily performed by USDA (such as research and field ration tests in extreme environments with military units engaged in simulated combat exercises).

Military Nutrition Research Returns in 1984 …

-Following the NAS/NRC panel recommendations, a small Military Nutrition task force was established at the US Army Institute of Environmental Medicine at Natick, MA

USARIEM



David Schnakenberg, PhD, COL, MSC

1984: A New Beginning for Military Nutrition Research and the need for the CMNR

- This newly formed small nutrition task force at USARIEM did not have the full spectrum of nutrition expertise to expertly advise the Assistant Surgeon General on all related issues of nutrition and ration development
- An increasing number of nutrition issues arose as the Army moved to a radically different Combat Field Feeding System in the 1980's

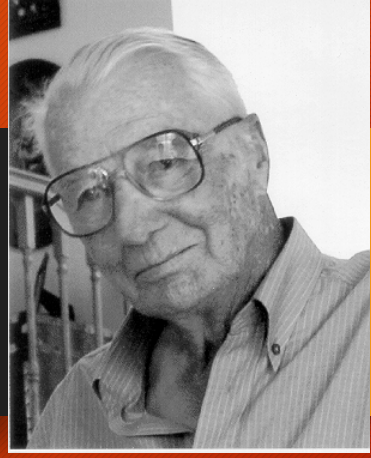
Hence, the formation of
The Committee on Military Nutrition Research

Acknowledgment of Members and Chairs of the Committee on Military Nutrition Research 1982-2012

Food and Nutrition Board

- **Committee members and invited expert speakers**
- **Past chairs of the CMNR and NAS Program Officers/Study Directors**

Robert Nesheim, Ph.D.
First Chair, Committee on Military Nutrition
1982-1998



- Chaired the Committee on Military Nutrition for its first 16 years. Through his leadership, the Committee:

  -Chaired DoD panel recognizing need for Military Nutrition Research
  - Formed the original CMNR
  - Set standards for water and nutrient consumption by the soldiers
  - Helped develop guidelines for evaluating body weight and physical performance

- Dr. Nesheim served as a WWII Field Artillery Army officer

JOHN E. VANDERVEEN, Ph.D.

Chair Committee on Military Nutrition
1998-2002

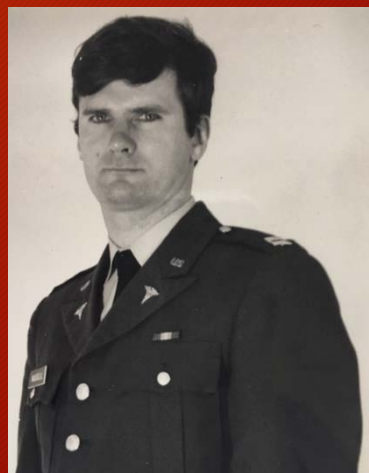
- Chaired the Committee 1998-2002
- Director of the Division of Nutrition at the Center for Food Safety (FDA) and Applied Nutrition.
- Dr. Vanderveen chaired the CMNR report on "Caffeine for the Sustainment of Mental Task Performance: Formulations for Military Operations "
- Dr. Vanderveen served at the U.S. Air Force School of Aerospace Medicine at Brooks Air Force Base, Texas.

Robert Russell, M.D.
Chair, Committee on Military Nutrition
2005/2006

Former chair of the Food and Nutrition Board (FNB)

- Dr. Russell chaired the Committee on Military Nutrition for the 2005/2006 comprehensive Report:
  "Mineral Requirements for Military Personnel"

- Dr. Russell Served in the U.S. Army at Brooke Army Medical Center, Walter Reed Army Institute of Research, and the 20th Preventive Medicine Unit, Long Binh, Vietnam



John Erdman, Ph.D.
Chair, Committee on Military Nutrition Research
2002- 2011

- Chaired the committee from 2002-2011
- Dr. Erdman's contributions as Chair of the CMNR included:

  -Nutrient Composition of Rations for Short-Term, High-Intensity Combat Operations

  -Use of Dietary Supplements by Military Personnel

  -Nutrition and Traumatic Brain Injury
- Dr. Erdman served as a Lieutenant in Vietnam in the Army Corps of Engineers

Program Directors/Study Directors from IOM/FNB

Editors for National Academy Press
Committee on Military Nutrition Reports

https://www.nap.edu/initiative/committee-on-military-nutrition-research?n=10&start=0

Food and Nutrition Board

- Susan Berkow, Ph.D.
- Bernadette Marriott, Ph.D.
- Mary Poos, MS
- Sydne Carlson-Newberry, MS
- Rebecca B. Costello, Ph.D.
- Maria Oria, Ph.D.

CMNR Symposium Proceedings

Example of an IOM/NAS Report from 1996 Committee on Military Nutrition Workshop

Food and Nutrition Board

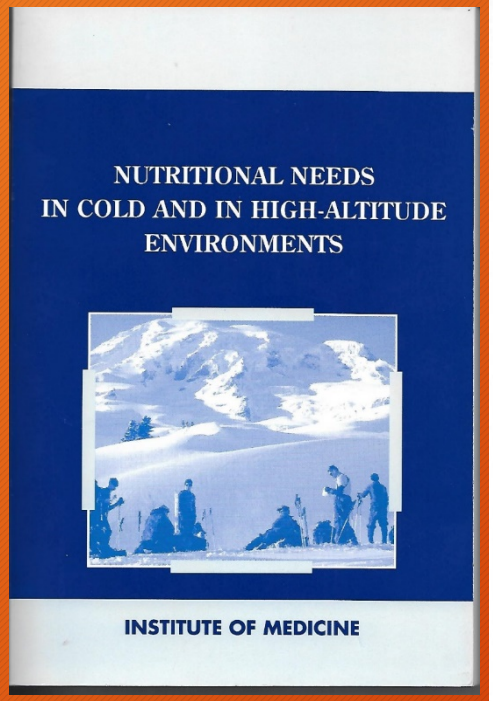


TABLE 1-1 Questions Pertaining to Nutritional Needs in Cold and in High-Altitude Environments Posed by the MND to the CMNR

Performance

- What is the effect of cold/altitude exposure on muscle strength and endurance?
- Can diet influence these changes?
- How does cold/altitude exposure influence appetite?

Health and Medical Aspects

- Is there concern for increased cardiovascular risk when a high fat diet is consumed for intermittent (7- to 14-d) time periods in the cold?
- What nutrients prevent or lessen the signs and symptoms of acute altitude exposure?
- Is free radical formation a concern for prolonged (10- to 30-d) military operations at 10,000–15,000 ft (3,048–4,572 m) elevation?

Thermoregulation and Acclimatization

- Is cold/altitude acclimatization facilitated by prior satisfactory nutritional status or supplemental nutrients?
- What nutrients influence thermoregulation?
- Does the timing of food ingestion influence cold tolerance?
- What is the relationship between fluid intake and thermoregulation in the cold and at altitude?

Nutritional Requirements

- What are typical energy requirements for work in cold and high-altitude environments?
- What is the effect of cold and altitude exposure (at rest) on basal energy requirements?
- Does cold or altitude exposure alter the requirement for nutrients other than energy?
- What is the sodium requirement for hard physical work in a cold environment?
- What is the relationship between fluid intake and food intake in the cold/altitude?

2

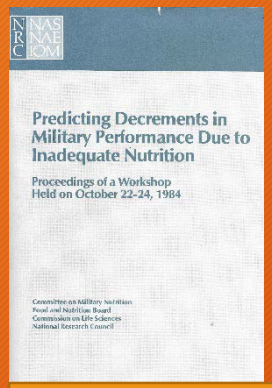
Committee on Military Nutrition Research Recommendations and Conclusions

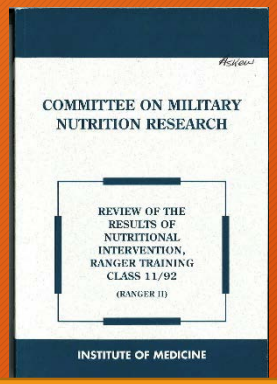
CONTENTS

As stated in Chapter 1, the Committee on Military Nutrition Research (CMNR) was asked to respond to 15 specific questions that address factors affecting nutrient requirements and food intake for work in cold and in high-

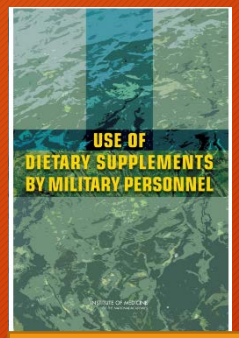
Science-based Ration Research & Development for Soldier Health & Performance

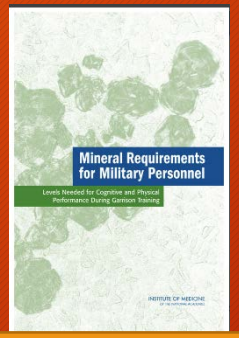
Resulting from joint cooperation of the FNB Committee on Military Nutrition, Military Nutritionists, & Military Food Scientists

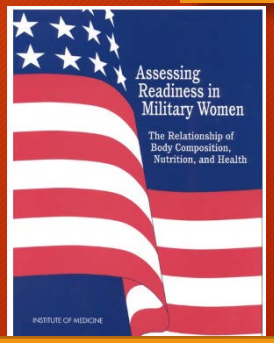


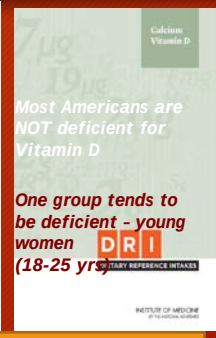


Identified Energy as key to sustaining Endocrine & Immune function as well as cold tolerance and physical performance in stressful field conditions (Cold, High Altitude, Ranger and Special Ops Training)





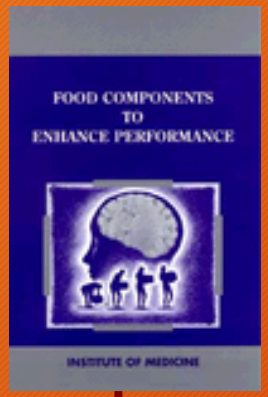




Report recommendations led to study of vitamin and mineral status and bone mineral health of female military recruits during initial military training.
Resulting in an increased allowance of iron supplementation, calcium and vitamin D fortification for female service members

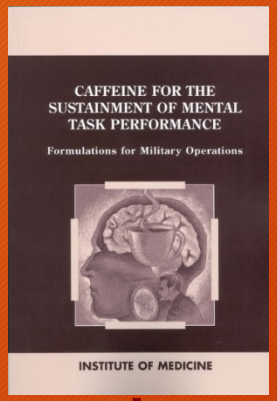
Science-based Ration Research & Development for Soldier Health & Performance

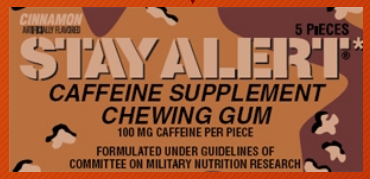
Resulting from joint cooperation of the FNB Committee on Military Nutrition, Military Nutritionists, & Military Food Scientists



Tyrosine

Cognitive flexibility- ability to switch quickly between tasks
Sleep and alertness
Mental decline and cognition in short-term, stressful or mentally demanding situations



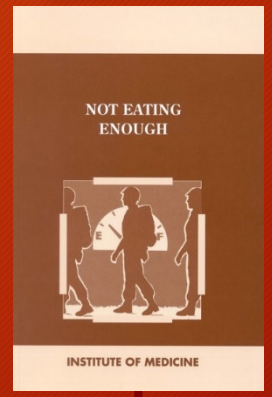


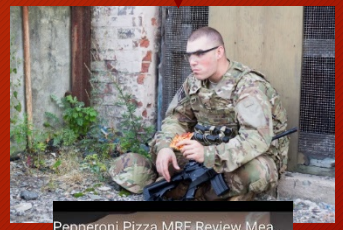
Caffeine

Improved alertness and choice reaction times

Quick Easy to Eat Energy Sources

Pocket sandwiches, energy bars, carbohydrate enhanced applesauce, high energy drinks, pouches of tuna, chunk chicken and caffeine gum

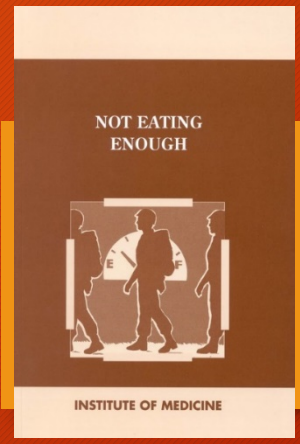




Increased palatability

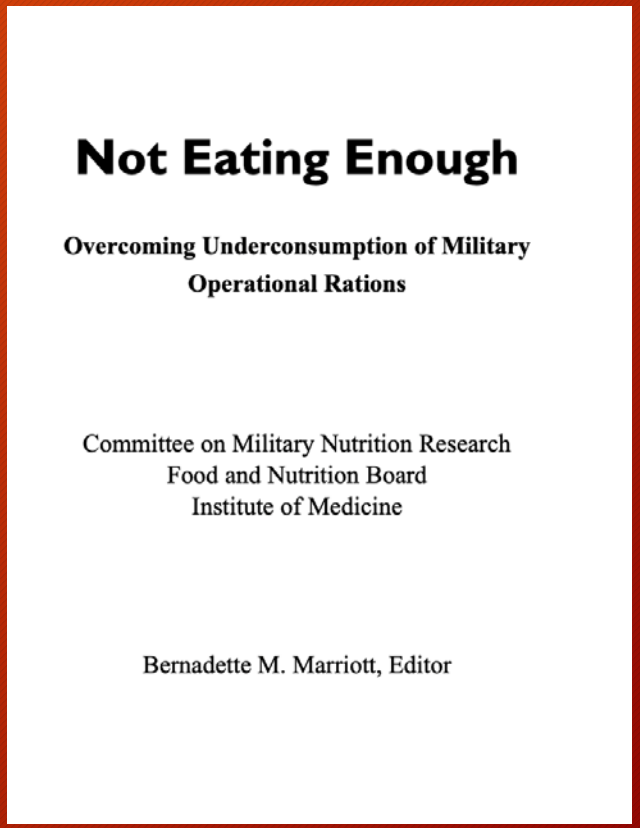
and food choices reducing the energy deficit

Committee on Military Nutrition Workshop to address suboptimum Field Ration (MRE) Consumption



Gerry Darsch, Director
Natick Combat Field Feeding

Chairman of the Joint Chiefs of Staff Gen. Colin Powell told Darsch: “Fix the MRE”


Not Eating Enough

Overcoming Underconsumption of Military Operational Rations

Committee on Military Nutrition Research
Food and Nutrition Board
Institute of Medicine

Bernadette M. Marriott, Editor

What Soldiers Really Want is often not practical or what's best for them… Familiarity & Palatabilty Key to Field Ration Development

Ration Developers and the CMNR helped reach a happy middle ground of rations that are familiar, palatable and nutritionally complete

New and Improved MRE Field Rations

MRE Menu Listings

2019

Here are the official complete MRE menu listings for all production years. These menus (especially the older ones – I-XII) were put together by some helpful folk from Natick (via MREInfo's friend, Mirage). The later menus are from the Defense Logistics Agency.

MRE XXXIX (2019)

01 – Chili with Beans

02 – Shredded Beef in Barbecue Sauce

03 – Chicken, Egg Noodles, and

04 – Spaghetti with Beef and Sauce

05 – Chicken Chunks

06 – Beef Taco

07 – Beef Strips in a Savory Tomato Based Sauce

08 – Meatballs in Marinara Sau

09 – Beef Stew

11 – Vegetable Crumbles with Pasta in Taco Sauce

12 – Elbow Macaroni in Tomato Sauce

13 – Cheese Tortellini in Tomato Sauce

14 – Creamy Spinach Fettuccine

15 – Mexican Style Chicken Stew

16 – Chicken Burrito Bowl

17 – Maple Pork Sausage Patty

18 – Beef Ravioli in Meat Sauce

19 – Beef Patty, Grilled Jalapeno Pepper Jack

20 – Hash Brown Potatoes with Bacon, Peppers and Onion

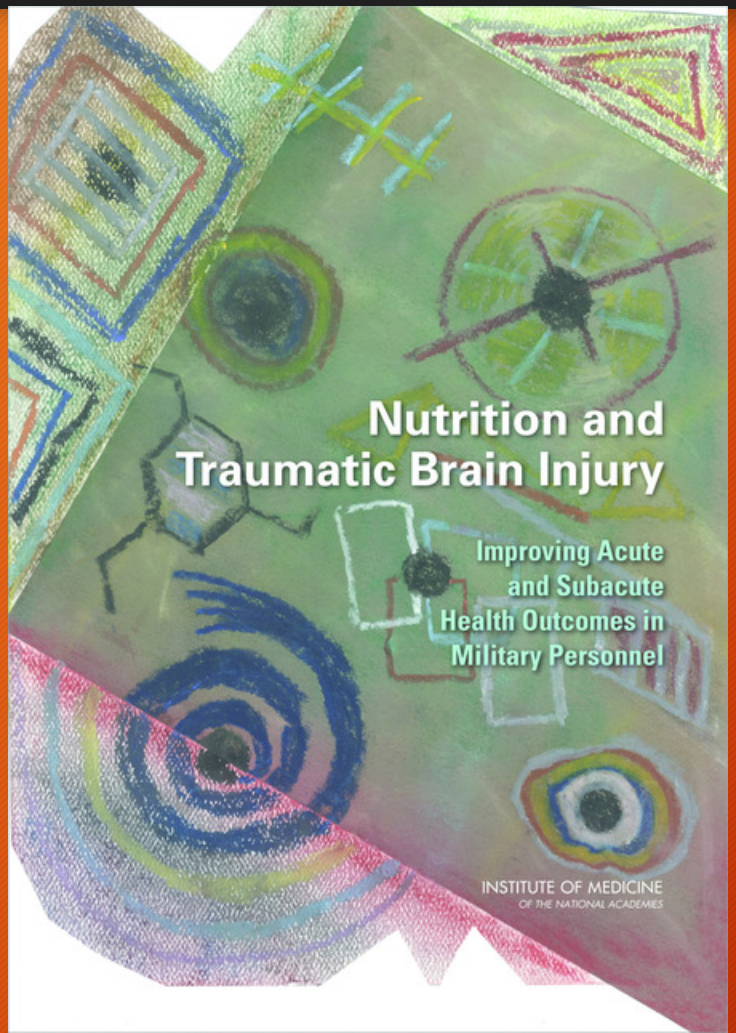
21 – Lemon Pepper Tuna

22 – Beef Goulash

23 – Pepperoni Pizza Slice

24 – Southwest Beef and Black Beans with Sauce

The Most Recent CMNR Report "Nutrition and Traumatic Brain Injury" 2012

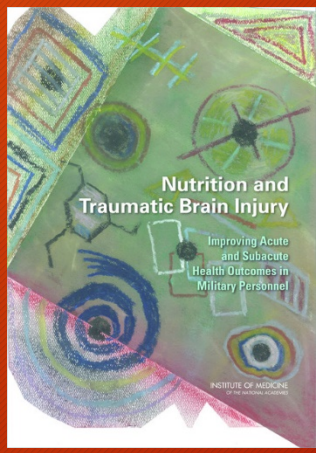


The CMNR was asked **to review the potential role of nutrition in improving the acute outcomes of traumatic brain injury (TBI) among military** service members.

The committee identified promising nutrition related research in these areas:

-CDP Choline
-Creatine
-Omega 3 fatty acids
-Zinc
-Insulin therapy TPN vs Enteral
-Timing to meet total energy expenditure

Most Recent example of Military Traumatic Brain Injury



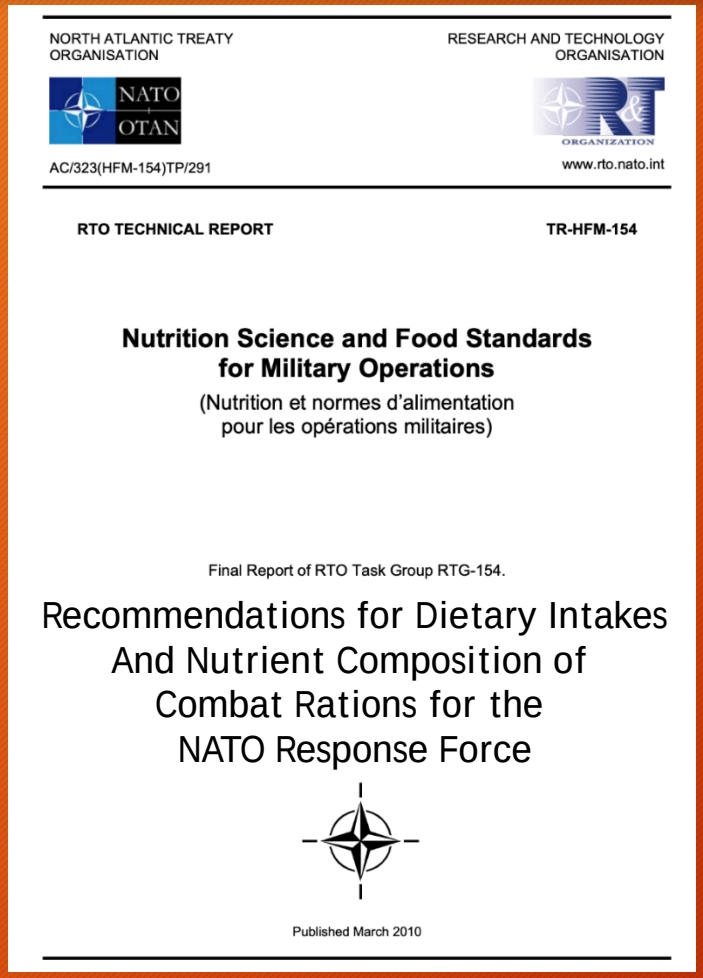
February 10,2020

The Department of Defense has announced that there are now 109 cases where U.S. service members have been diagnosed with mild traumatic brain injuries.
The 109 cases of mTBI is an increase of 45 cases since the previous report.

https://www.13newsnow.com/article/news/nation-world/military-to-announce-over-100-us-troops-with-brain-injuries-after-iran-attack/507-2dab3db8-b195-4894-b4a3-15160d54685c

International Contributions of the CMNR: Standardization of NATO Rations

Food and Nutrition Board



NORTH ATLANTIC TREATY ORGANISATION

RESEARCH AND TECHNOLOGY ORGANISATION

NATO OTAN

AC/323(HFM-154)TP/291

www.rto.nato.int

RTO TECHNICAL REPORT

TR-HFM-154

Nutrition Science and Food Standards for Military Operations

(Nutrition et normes d'alimentation pour les opérations militaires)

Final Report of RTO Task Group RTG-154.

Recommendations for Dietary Intakes And Nutrient Composition of Combat Rations for the NATO Response Force

Published March 2010

CMNR Accomplishments
1982-2012

- The CMNR provided authoritative advice and specific reviews of military nutrition policy and military dietary nutritional standards and allowances (AR 40-25)
- The CMNR conducted special reviews to address urgent questions from the Army Surgeon General, such as antioxidant nutrition, iron and vitamin D status in military women, and use of high-fat calorie dense rations
- The CMNR evaluated and reviewed nutritional influences on military physical and cognitive performance, providing impetus to the military core research program of Performance Enhancing Ration Components (PERC)
- The CMNR conducted periodic site reviews of the congressionally directed Pennington Biomedical Research Center research support to military nutrition and research programs
- The CMNR contributed to NATO Military ration standardization

“Energizer Bunny” Award”
Advocate for the Committee on Military Nutrition Research

Thanks to David Schnakenberg
PhD, COL, MSC, Ret
Commander, USARIEM
June 1986- April 1989,

Robert Olaf Nesheim, Ph.D.

Strong Advocate and Supporter of Military Nutrition Research

The Journal of Nutrition, Volume 139, Issue 2, February 2009, Pages 197–198, https://doi.org/10.3945/jn.108.102178