1. Record Nr. UNINA9910960560303321

Titolo	Nutritional needs in cold and in high-altitude environments : applications for military personnel in field operations / / Committee on Military Nutrition Research, Food and Nutrition Board, Institute of Medicine ; Bernadette M. Marriott and Sydne J. Carlson, editors
Pubbl/distr/stampa	Washington, D.C., : National Academy Press, 1996
ISBN	9786610210817 9780309175593 0309175593 9781280210815 1280210818 9780309556774 0309556775 9780585098425 0585098425
Edizione	[1st ed.]
Descrizione fisica	xv, 568 p. : ill
Altri autori (Persone)	MarriottBernadette M NewberrySydne J
Disciplina	613.2
Soggetti	Nutrition - Requirements Cold - Physiological effect Altitude, Influence of Soldiers - Nutrition - Requirements
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Proceedings of a workshop sponsored by the Committee on Military Nutrition Research of the Food and Nutrition Board, Institute of Medicine, National Academy of Sciences.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Nutritional Needs In Cold And In High-Altitude Environments -- Copyright -- Preface -- FOCUS OF THE REPORT -- HISTORY OF THE COMMITTEE -- COMMITTEE TASK AND PROCEDURES -- ACKNOWLEDGMENTS -- Contents -- I COMMITTEE SUMMARY AND RECOMMENDATIONS -- 1 A Review of the Physiology and Nutrition in Cold and in High-Altitude Environments by the Committee on Military

Nutrition… -- PROJECT OVERVIEW -- THE COMMITTEE'S TASK -- MILITARY RESEARCH, COMMAND ISSUES, AND RATIONS FOR COLD AND FOR HIGH-ALTITUDE ENVIRONMENTS -- THE COLD ENVIRONMENT -- PHYSIOLOGICAL CHANGES IN THE COLD -- Basic Physiology of Cold Exposure -- Peripheral Vasoconstriction and Vasodilation -- Metabolic Heat Production -- Cardiac Responses -- Effect of Gender -- Effect of Age -- Other Factors -- Central Nervous System Function and Sleep -- The Role of the Central Nervous System and Sleep during Cold Stress -- Stages of Sleep -- Interrelation of Sleep and Temperature Regulation -- Sleep and Temperature Regulation in Humans -- Thermoregulation and Physical Performance -- Drug-Induced Delay of Hypothermia -- CHANGES IN NUTRIENT REQUIREMENTS FOR COLD ENVIRONMENTS -- Fluid Balance -- Mechanisms of Cold-Induced Diuresis -- Other Causes of Cold-Induced Losses of Body Water -- Performance Decrements Caused by Cold-Induced Dehydration -- Macronutrients -- Energy Sources -- Protein -- Vitamins -- Minerals -- APPETITE AND BEHAVIOR CHANGES IN THE COLD -- THE HIGH-ALTITUDE ENVIRONMENT -- PHYSIOLOGICAL CHANGES AT HIGH ALTITUDES -- Basic Physiology of High-Altitude Exposure -- Biophysical Realities of High Altitudes -- Physiological Responses at High Altitudes -- Water Balance at High Altitudes -- Acclimatization to High Altitudes -- Altitude-Induced Illness -- Acute Mountain Sickness (AMS) -- Subacute Mountain Sickness -- High-Altitude Cerebral Edema (HACE) -- High-Altitude Pulmonary Edema (HAPE).
Weight Loss at High Altitudes -- Effects of Age and Gender on Response to Altitude -- CHANGES IN NUTRIENT REQUIREMENTS AT HIGH ALTITUDES -- Macronutrients -- Energy Sources -- Protein -- Vitamins -- Minerals -- APPETITE AND BEHAVIOR CHANGES AT HIGH ALTITUDES -- Mental Response to High Altitudes -- The Effect of Altitude on Cognitive Performance and Mood States -- Food Components that May Enhance Mental Performance at High Altitudes and in the Cold -- Military Considerations -- INTERACTIONS OF COLD AND HIGH ALTITUDES -- SUMMARY -- REFERENCES -- 2 Committee on Military Nutrition Research Recommendations and Conclusions -- ANSWERS TO QUESTIONS POSED BY THE ARMY -- Performance -- Health and Medical Aspects -- Thermoregulation and Acclimatization -- Nutritional Requirements -- RECOMMENDATIONS -- Water and Dehydration -- Energy and Specific Nutrients -- Education and Logistics -- AREAS FOR FUTURE RESEARCH -- Water and Dehydration -- Energy -- Specific Nutrients -- Performance and Medical Conditions -- Military Ration Development and Guidance -- CONCLUSIONS -- REFERENCES -- II BACKGROUND AND INTRODUCTION TO THE TOPIC -- 3 Cold-Weather and High-Altitude Nutrition: Overview of the Issues -- INTRODUCTION -- PREVIOUS SYMPOSIA -- PREVIOUS MILITARY RESEARCH: THE POLE MOUNTAIN WYOMING WINTER PROJECT -- GOALS OF THE 1993 WORKSHOP AND THIS BOOK -- AUTHOR'S CONCLUSIONS -- ACKNOWLEDGMENTS -- REFERENCES -- 4 Leadership Insights for Military Operations in Cold Weather and at High Altitudes -- INTRODUCTION -- THE MIND AND LEADERSHIP -- DIET -- MEDICAL CASUALTIES -- TRAINING TROOPS -- PHYSICAL CONDITION OF TROOPS -- CLOTHING AND EQUIPMENT -- AUTHOR'S CONCLUSIONS -- 5 Cold-Weather Field Feeding: Military Rations -- INTRODUCTION -- MILITARY RECOMMENDED DIETARY ALLOWANCES FOR COLD WEATHER -- MILITARY RATIONS USED IN COLD WEATHER -- Group Feeding Rations -- Tray Pack.
Individually Packaged Rations -- Meal, Ready-to-Eat -- Ration, Cold Weather -- Long-Range Patrol, Improved -- SELECTING A MILITARY RATION FOR COLD-WEATHER OPERATIONS -- AUTHOR'S CONCLUSIONS

-- REFERENCES -- 6 Feeding the U.S. Army Sixth Infantry Division (Light) in the Cold -- INTRODUCTION -- THE U.S. ARMY FAMILY OF RATIONS -- EQUIPMENT PROBLEMS: THE MOBILE KITCHEN TRAILER -- AN EQUIPMENT SOLUTION: THE KITCHEN COMPANY LEVEL FIELD FEEDING EQUIPMENT -- THE U.S. ARMY FIELD FEEDING SYSTEM -- SUMMARY -- AUTHOR'S RECOMMENDATIONS -- REFERENCES -- II Discussion -- III THE COLD ENVIRONMENT -- 7 Physiology of Cold Exposure -- INTRODUCTION -- HUMAN HEAT BALANCE IN THE COLD -- Biophysical Factors -- Physiological Responses -- Vasomotor Responses -- Metabolic Responses -- Energy Substrate Utilization -- Effects of Exercise on Thermoregulation in the Cold -- Cardiovascular Responses to Exercise in the Cold -- Influence of Cold on Muscle Energy Metabolism -- INDIVIDUAL CHARACTERISTICS MODIFYING HUMAN HEAT BALANCE IN THE COLD -- Anthropometry -- Physical Fitness -- Age and Gender -- Acclimatization -- AUTHORS' CONCLUSIONS AND RECOMMENDATIONS -- REFERENCES -- 8 Military Schedules vs. Biological Clocks -- INTRODUCTION -- BIOLOGICAL CLOCKS: FROM MINUTES TO YEARS -- DIFFERENT CIRCADIAN CLOCKS: SLEEP/WAKEFULNESS AND BODY TEMPERATURE -- Sleep/Wakefulness -- Thermal Regulation in the Cold -- Sleep and Core Temperature -- External Temperatures and Sleep -- Sleep and Nutrition -- THE REAL WORLD: MILITARY OPERATIONS AND TRAINING -- Technology to the Rescue: Antiquity to the Present -- The Challenge: Field Studies in Bosnia -- AUTHORS' CONCLUSION -- REFERENCES -- 9 Influence of Cold Stress on Human Fluid Balance -- INTRODUCTION -- Military Situation Regarding Fluid Balance in the Cold -- Body Fluid States -- FACTORS CAUSING DEHYDRATION -- Cold-Induced Diuresis. Respiratory Water Losses -- Cold-Weather Clothing -- Metabolic Cost of Movement in Cold Terrain -- Reduced Fluid Intake -- Fluid Delivery -- Frozen Drinking Water -- Inadequate Drinking -- Fluid in Cold-Weather Rations -- Summary -- MILITARY IMPACT AND SIGNIFICANCE OF DEHYDRATION IN THE COLD -- Dehydration Effects on Physical and Cognitive Performance -- Dehydration and Thermoregulation -- Dehydration and Cold-Injury Susceptibility -- Summary Comments -- COUNTERMEASURES TO DEHYDRATION -- AUTHORS' CONCLUSIONS AND RECOMMENDATIONS -- ACKNOWLEDGMENTS -- REFERENCES -- 10 Muscle Metabolism and Shivering During Cold Stress -- INTRODUCTION -- CARBOHYDRATE AVAILABILITY AND COLD TOLERANCE -- FAT UTILIZATION AND SHIVERING -- THE PREFERRED FUEL -- AUTHOR'S CONCLUSIONS AND RECOMMENDATIONS -- REFERENCES -- 11 Macronutrient Requirements for Work in Cold Environments -- INTRODUCTION -- ENERGY BALANCE AND REQUIREMENT IN THE COLD -- Studies Showing Increased Requirements Using Energy Intake Data -- Studies Showing Minimal Effects of Cold Environments on Energy Requirement Determined by Energy Intake -- Underreporting of Energy Intakes -- Studies Measuring Energy Requirements Using Energy Expenditure Data -- Mechanism of Action of Effects of Cold on Metabolism -- OPTIMAL MACRONUTRIENT RATIO IN THE COLD -- AUTHORS' CONCLUSIONS AND RECOMMENDATIONS -- REFERENCES -- 12 Cold Exposure, Appetite, and Energy Balance -- INTRODUCTION -- COMPONENTS OF ENERGY EXPENDITURE IN THE COLD -- Basal Metabolic Rate -- Thermogenic Effect of Feeding -- Thermogenic Effect of Cold -- Thermogenic Effect of Exercise -- MEASUREMENTS OF CALORIE INTAKE ON ARCTIC EXPEDITIONS -- APPETITE AND BODY WEIGHT GAIN IN ARCTIC EXPEDITIONS -- Palatability of Food -- Cold Temperature -- Season of the Year -- Emotional Factors -- Physical Activity -- AUTHOR'S CONCLUSIONS -- REFERENCES.

13 Effects of Cold and Altitude on Vitamin and Mineral Requirements -- INTRODUCTION -- ESTIMATED ENERGY INTAKES -- FAT-SOLUBLE VITAMINS -- Vitamin A -- Functions -- Intake and Status -- Author's Recommendation -- Vitamin D -- Functions -- Intake and Status -- Author's Recommendation -- Vitamin E -- Author's Recommendation -- Vitamin K -- Functions -- Status and Intake -- Author's Recommendation -- WATER-SOLUBLE VITAMINS -- Thiamin -- Functions -- Intake and Status -- Author's Recommendation -- Niacin -- Functions -- Intake and Status -- Author's Recommendation -- Riboflavin -- Functions -- Intake and Status -- Author's Recommendation -- Vitamin B6 -- Functions -- Intake and Status -- Author's Recommendation -- Vitamin B12 -- Functions -- Intake and Status -- Author's Recommendation -- Pantothenic Acid -- Functions -- Intake and Status -- Author's Recommendation -- Biotin -- Functions -- Intake and Status -- Author's Recommendation -- Folic Acid -- Function -- Intake and Status -- Author's Recommendation -- Vitamin C -- Functions -- Intake and Status -- Author's Recommendation -- MINERALS -- Calcium -- Functions -- Intake and Status -- Author's Recommendation -- Phosphorus -- Functions -- Intake and Status -- Author's Recommendation -- Magnesium -- Functions -- Intake and Status -- Author's Recommendation -- Iron -- Functions -- Intake and Status -- Author's Recommendation -- Zinc and Copper -- Functions -- Intake and Status -- Author's Recommendation -- Other Trace Minerals -- Author's Recommendation -- AUTHOR'S CONCLUSIONS AND RECOMMENDATIONS -- REFERENCES -- 14 Micronutrient Deficiency States and Thermoregulation in the Cold -- INTRODUCTION -- THERMAL BALANCE -- IRON DEFICIENCY -- Anemia vs. Tissue Iron Deficiency -- Neurohormones -- Thyroid Hormones -- COPPER DEFICIENCY -- ZINC DEFICIENCY -- AUTHOR'S CONCLUSIONS -- REFERENCES.
15 Drug-Induced Delay of Hypothermia.

Sommario/riassunto

This book reviews the research pertaining to nutrient requirements for working in cold or in high-altitude environments and states recommendations regarding the application of this information to military operational rations. It addresses whether, aside from increased energy demands, cold or high-altitude environments elicit an increased demand or requirement for specific nutrients, and whether performance in cold or high-altitude environments can be enhanced by the provision of increased amounts of specific nutrients.