

FIELD FEEDING TRANSFORMATION: IS THERE A REQUIREMENT FOR
FOOD SERVICE PERSONNEL IN SUPPORT OF THE
STRYKER BRIGADE COMBAT TEAM?

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

WILLIE RIOS III, MAJ, USA
B.B.A., Texas Southern University, Houston, Texas 1991

Fort Leavenworth, Kansas
2002

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE

Form Approved OMB No.
0704-0188

Public reporting burden for this 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 this 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 Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 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 any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 06-06-2003	2. REPORT TYPE thesis	3. DATES COVERED (FROM - TO) 05-08-2002 to 06-06-2003
---	--------------------------	--

4. TITLE AND SUBTITLE FIELD FEEDING TRANSFORMATION IS THERE A REQUIREMENT FOR FOOD SERVICE PERSONNEL IN SUPPORT OF THE STRYKER BRIGADE COMBAT TEAM? Unclassified	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S) Rios, Willie,	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Command and General Staff College 1 Reynolds Ave Fort Leavenworth, KS66027-1352	8. PERFORMING ORGANIZATION REPORT NUMBER ATZL-SWD-GD
--	---

9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS ,	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
A1,Administrative or Operational Use
06-06-2003
US Army Command and General Staff College
1 Reynolds Ave
Fort Leavenworth, KS66027-2314

13. SUPPLEMENTARY NOTES

14. ABSTRACT
This study examines the requirement for having food service personnel within the Stryker Brigade Combat Team (SBCT) based on the decision to remove them in support of transformation goals. Due to the streamlining and shifting of combat service support (CSS) personnel from within the SBCT with regards to food service personnel (FSP), the main thesis for this paper is whether or not the SBCT requires FSP to perform field-feeding operations. The current SBCT concept eliminates having organic FSP from within the brigade combat team and will require them to augment the SBCT at a predetermined timeline. This paper will determine whether this transformation goal as set forth by Army leaders was the right decision. Four subject areas were used to analyze whether or not FSP were required under this new concept: rations, equipment, food safety and protection, and flexibility. The study explains the implications that will arise if this decision remains as is, to include certain risks that Army leaders must be willing to assume. This study promotes having FSP within the SBCT because field-feeding is a combat multiplier that sustains combat power over time by improving morale and enhancing the warfighters physical and mental capabilities.

15. SUBJECT TERMS
Brigade Combat Team (SBCT); Combat Service Support Operations; Food service personnel; Organization.

16. SECURITY CLASSIFICATION OF:	17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 74	19. NAME OF RESPONSIBLE PERSON Buker, Kathy kathy.buker@us.army.mil
---------------------------------	--	---------------------------	---

a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified	19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 9137583138 DSN 5853138
---------------------------	-----------------------------	------------------------------	--

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: MAJ Willie Rios III

Thesis Title: Field Feeding Transformation: Is There a Requirement for Food Service Personnel in Support of the Stryker Brigade Combat Team?

Approved by:

_____, Thesis Committee Chair
LTC Tracy L. Wickham, M.B.A.

_____, Member
LTC Harold J. Bochsler, M.B.A.

_____, Member
LTC Michael A. Wooten, M.A.

_____, Member, Consulting Faculty
COL Marshall J. Goby, Ph.D.

Accepted this 6th day of June 2003 by:

_____, Director, Graduate Degree Programs
Philip J. Brookes, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

FIELD FEEDING TRANSFORMATION: IS THERE A REQUIREMENT FOR FOOD SERVICE PERSONNEL IN SUPPORT OF THE STRYKER BRIGADE COMBAT TEAM? by MAJ Willie Rios III, USA, 68 pages.

This study examines the requirement for having food service personnel within the Stryker Brigade Combat Team (SBCT) based on the decision to remove them in support of transformation goals.

Due to the streamlining and shifting of combat service support (CSS) personnel from within the SBCT with regards to food service personnel (FSP), the main thesis for this paper is whether or not the SBCT requires FSP to perform field-feeding operations. The current SBCT concept eliminates having organic FSP from within the brigade combat team and will require them to augment the SBCT at a predetermined timeline. This paper will determine whether this transformation goal as set forth by Army leaders was the right decision. Four subject areas were used to analyze whether or not FSP were required under this new concept: rations, equipment, food safety and protection, and flexibility.

The study explains the implications that will arise if this decision remains as is, to include certain risks that Army leaders must be willing to assume. This study promotes having FSP within the SBCT because field-feeding is a combat multiplier that sustains combat power over time by improving morale and enhancing the warfighters physical and mental capabilities.

ACKNOWLEDGMENTS

First and foremost I must thank my wife Annie and children Willie IV and Allie for their patience and understanding while I labored through this effort. The hours my family allowed me to escape to research and write my thesis was a hardship for them and is much appreciated.

I would like to extend a special thanks to my committee, LTC Tracy Wickham, LTC Michael Wooten, LTC Harold Bochsler, and COL Marshall Goby. Their support, patience, and thought provoking critiques made the process an invaluable learning experience. Special thanks goes out to LTC Wickham for his mentoring and guiding me through the thesis process.

Last, but not least, I would also like to recognize my parents, Willie Jr. and Evangelina. Much of what I have accomplished, I owe to them.

TABLE OF CONTENTS

	Page
THESIS APPROVAL PAGE	ii
ABSTRACT	iii
ACKNOWLEDGMENTS	iv
ACRONYMS	vi
LIST OF ILLUSTRATIONS	vii
TABLES	vii
CHAPTER	
1. INTRODUCTION	1
2. LITERATURE REVIEW	13
3. RESEARCH METHODOLOGY	23
4. ANALYSIS	29
5. CONCLUSIONS AND RECOMMENDATIONS	54
GLOSSARY.....	61
REFERENCE LIST	63
INITIAL DISTRIBUTION LIST	66
CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT.....	67

ACRONYMS

AOE	Army of Excellence
BCT	Brigade Combat Team
CASCOM-DCD	Combined Arms Support Command-Directorate of Combat Development
CSS	Combat Service Support
CSSC	Combat Service Support Company
DNBI	Disease and nonbattle injuries
DSB	Division Support Battalion
FSP	Food Service Personnel
FXXI	Force XXI
UGR	Unitized Group Rations
H & S	Heat and Serve
METT-TC	Mission, Enemy, Terrain, Troops, Time, and Civilian Considerations
MRDA	Military Recommended Daily Allowance
MRE	Meal, Ready to Eat
NSOR	Nutritional Standard for Operational Rations
ODS	Operation Desert Storm
OF	Objective Force
OOTW	Operations Other Than War
SBCT	Stryker Brigade Combat Team
USARIEM	US Army Research Institute of Environmental Medicine

LIST OF ILLUSTRATIONS

Figure	Page
1. Field Feeding Transformation History.....	8
2. Food Service Structure Comparison	20
3. CSSC Organization.....	30
4. SBCT CSS Deployment Timeline.....	32

TABLES

Table	Page
1. Comparing Field Feeding Options.....	21
2. SBCT MTOE.....	31
3. Caloric Intake of Recent Rations Studies	35
4. Percentage of Calories from Protein, Fat, and Carbohydrates	36
5. Food Service Specialist Critical Task List.....	3

CHAPTER 1

INTRODUCTION

Overview

The Army is changing the conduct of war in the way it transports, maintains, and sustains its people and material. (Shinseki 1999)

General Eric K. Shinseki

The Army transformation from the Legacy Force to the Interim Force and finally to the Objective Force is in full progress. Standing up the Stryker Brigade Combat Team (SBCT) is the first step in the transformation process. The SBCTs mission is to deploy anywhere in the world in ninety-six hours from “wheels up” to closure. This deployment goal dictates that units become leaner, with lighter vehicles and with a reduced logistics force structure. The “Army Vision” and “Objective Force” doctrine outlines the characteristics and direction that the combat service support (CSS) community must take in order to meet this transformation goal. Once transformed the SBCT will have a direct effect on how CSS, in particular, field-feeding operations, will be conducted based on this goal. Future changes in the subsistence arena are geared toward sustaining a more mobile force while reducing the logistics footprint; this new footprint has eliminated the requirement for having organic food service personnel (FSP) within the brigade combat team. Based on the streamlining and shifting of CSS personnel from within the SBCT with regards to FSP, the main thesis for this paper is whether or not the SBCT requires FSP to perform field-feeding operations. This paper will determine whether this transformation goal as set forth by the Army leaders was the right decision.

The decision to remove FSP will either have a positive or negative impact on the level of support provided and may have a greater impact in other areas. The central theme

of this research is whether or not FSP are required to support the SBCT? Studies on the consequences were not conducted, which is one of the reasons this study is being conducted. Are the needs and requirements of the soldiers being overlooked? With the advent and introduction of improved rations, equipment upgrades, and doctrine changes the forces are becoming much more efficient. The question as to whether or not the shifting of logistical personnel in order to streamline the force will have an effect on combat readiness must also be analyzed. In addition, the impact that transformation will have on the soldier must be carefully looked at in order to provide the type of field-feeding support soldiers are accustomed too. Transformation in field-feeding has undergone many changes, but the current Army Vision will further redefine this role as CSS is transformed, according to the new characteristics: to a force that is agile, sustainable, deployable, survivable, lethal, responsive, and versatile (FM 1 2001, 33-35). These are the criteria that will help to answer whether or not FSP are required to support the SBCT. The question that now must be posed to the leaders is what are the acceptable risks that the Army is willing to assume by not having FSP providing this function?

SBCT Transformation Background

The SBCT is the intermediate force that will ultimately determine the requirement for successful implementation of the Objective Force (OF). Proposed changes will be tested in the SBCT only after all enablers (equipment, rations, force structure, and mission requirements) are in place to support and sustain combat power. Sustainment goals for the SBCT call for units to sustain themselves for three days in high tempo operations, without replenishment from external sources. They must function in continuous combat in mid-to-high intensity conflict and be self-sustainable for up to

seven days in low-end conflict and peacetime military engagement (Shinseki 1999). While the Army must remain optimized for major theater war, it must be sufficiently versatile and agile to handle smaller scale contingencies, which will occur more often presenting unique challenges. The Army must be capable of simultaneously conducting warfighting and stability operations and transitioning smoothly from one category of operation to the other and back again without any loss of momentum or operational focus. CSS as well must remain flexible during transformation for the successful implementation of the OF concept. Logistic efficiencies are necessary to support the very challenging sustainment time, distance, volume, and weight physiology paradigm (Shinseki 1999). Sustaining the warfighter in the future will dramatically change as new doctrine is introduced; the current challenge for CSS units is to adapt to the new methodology in order to remain relevant in support of the US national military strategy.

Field-feeding is one of many logistic functions that are being transformed to meet the new warfighting philosophy, and this is the topic that this paper will focus on. The decision to remove FSP from the brigade combat team (BCT) and relocate them into the Combat Service Support Company (CSSC), which is part of the Division Support Battalion (DSB), has been proposed in the draft Field Manual (FM) 4-93.7, *Combat Service Support to the Stryker Brigade Combat Team*. This shift of personnel has once again removed FSP from within combat units to units that augment based on mission, enemy, terrain, troops, time, and civilian considerations (METT-TC). FSP will now support from an augmentation role rather from an organic direct support role that has been synonymous with forces operating under the Army of Excellence (AOE) and Force XXI (FXXI) concept. Is this new change flexible with supporting maneuver units and

their commanders? In order to address whether this was the correct decision, the question on whether or not we require cooks must be answered prior to proceeding to any recommended support structure.

Food Service Transformation History

Transformation in field-feeding has undergone many changes throughout the years, but the theme has always centered on the motif: “How can we provide the right meal, at the right place and at the right time.” Ever since the US Army drew its first line in the sand at Lexington in the days of the American Revolution, commanders have been responsible for providing their soldiers with quality subsistence in a variety of environments and tactical situations. The Army Food Service Program has undergone drastic modifications in an ongoing attempt to adapt to the soldier's needs on the ever-changing battlefield. The Army is once again at a crossroads, the enemy and battlefield demographics have changed, and how it conducts field-feeding operations may impact future operational success.

The first field-feeding transformation incorporated food protection standards during the Spanish-American War (1898). This period convinced senior leaders of the need for reform in the way field-feeding was handled. One need only contemplate the fact that in the so-called “Splendid Little War” of a century ago, of the 3,862 who died, only 268 were killed by bullets or wounds. The overwhelming majority of fatalities (by a margin of 14 to 1) succumbed from disease and illness--in particularly foodborne illness that resulted in high disease and nonbattle field injuries (DNBI) (Anders 2002). Based on this fact, are the Army’s soldiers at risk by not having the qualified personnel in the form

of FSP available to train and provide the expertise required for food protection needed on a daily basis?

The period separating the Spanish American War from World War I indeed proved to be a reformist era, for the US military in general and quartermaster food service in particular. New types of feeding equipment, such as camp stoves, mobile kitchens, field bake ovens, and other types of cooking utensils were developed and introduced. In August 1912, Congress merged the old Pay, Subsistence, and Quartermaster Departments into a single Quartermaster Corps. From then on the Army subsistence and food service mission belonged squarely to the Quartermaster Corps. This same piece of legislation also had the effect of “militarizing” the corps, by allotting trained military personnel to do the work formerly done by hired civilian cooks. For the most part contractors played key roles in providing meals on the battlefield prior to this time period. The result of these changes was the standardization and formal training of what today has become the Army’s highly trained professional Food Service Specialist. The Quartermaster Corps opened a new Subsistence School in Chicago, Illinois, in 1920 to train officers, warrant officers, civilians, and senior noncommissioned officers (NCOs) in all aspects of Army food service management. This emphasized the management aspect of food service and placed greater importance in food preparation, handling, distribution, and food protection and safety.

The next transformation occurred after the attack on Pearl Harbor in December 1941. This period marked the introduction of a new line of field rations. A steady stream of diverse rations made their way through the developmental process and were rushed into production: A-, C-, D-, and K-rations; arctic and jungle-type rations; 5-in-1 and 10-

in-1 group rations; and assault packs, to name a few. New equipment as well, from truck-mounted stoves and ovens, to new types of cans and can openers, materials handling equipment, refrigerator vans, and again much more--all for the purpose of providing combat soldiers with the highest quality and the best prepared food available.

In the 1980s the Army had a feeding standard that provided all soldiers with one meal, ready to eat (MRE) and two hot meals per day. The hot meal was primarily tray rations (T-rations). The standard also allowed for two A-ration meals in a seven-day period. This policy did not provide the commander with the flexibility to take care of soldiers because it dictated ration cycles and did not consider operational tempo. At that same time, the US Army Quartermaster Center and School was aggressively pursuing a revised feeding standard to provide the commander with the ability to give all soldiers on the battlefield the right meal, at the right place and at the right time. The revised feeding policy simply stated that field commanders must provide their soldiers with three quality meals per day. This revised feeding policy was approved in November 1990 and successfully exercised during Operation Desert Storm (ODS).

During ODS Army food service personnel faced an enormous challenge: how to feed a force of nearly 400,000 troops, deployed at a distance of some 8,000 miles from home, in an inhospitable desert environment. Yet, they more than met the challenge; they were instrumental in serving upwards of 94 million meals over the course of six months (Anders 2002, 15). During this operation the Army implemented new support concepts by maximizing the use of host nation support in the form of contracted dining facilities, milk, bread, fresh fruits, and vegetables.

Currently, the Army is operating under the AOE and FXXI concepts. Under FXXI the location of cooks was altered much like the proposed SBCT concept. Under the AOE concept for support, FSP are organic within each of the maneuver brigades manning tables with command and control responsibilities belonging to the maneuver battalions. As units deploy, so do their cooks. The theory behind assigning the resources to the battalions was based on providing commanders with the ability to respond to changing tactical situations. The AOE and FXXI field-feeding standard operates under the concept that is outlined in FM 10-23, *Army Field-feeding System-Future (AFFS-F)*. This concept was approved by the Army Chief of Staff in 1992 and consists of three quality meals per day with one A-ration prepared by cooks, METT-TC dependent. The other two daily meals come from the family of operational rations that include MREs and T-rations since changed to Unitized Group of Rations Heat and Serve (UGR-H&S).

The FXXI feeding standard under this concept continues to provide three types of rations: individual combat rations (MRE), heat and serve rations (T-rations/UGR-H&S), and prepared rations (A-rations). AFFS-F continues to provide the soldier one prepared meal and a heat-and-serve meal per day, METT-TC dependent. There was no change or introduction of new field-feeding equipment under this concept; the mobile kitchen trailer (MKT) and kitchen company level field-feeding equipment-enhanced (KCLFFE-E) continues to remain the cornerstone for food preparation. The major change included the realignment of FSP and equipment from within the maneuver units to within the Forward Support Company (FSC) located in the Forward Support Battalion (FSB). FSP provide consolidated food preparation for the FSC and maneuver battalion. The FSC can prepare meals forward in each company area based on METT-TC, by sending FSP forward to the

battalion trains. Figure 1 lays out a historical analysis on the various support structures that are in existence within the Army. The figure depicts the unit location from where cooks are located on the battlefield to include SBCT proposals.

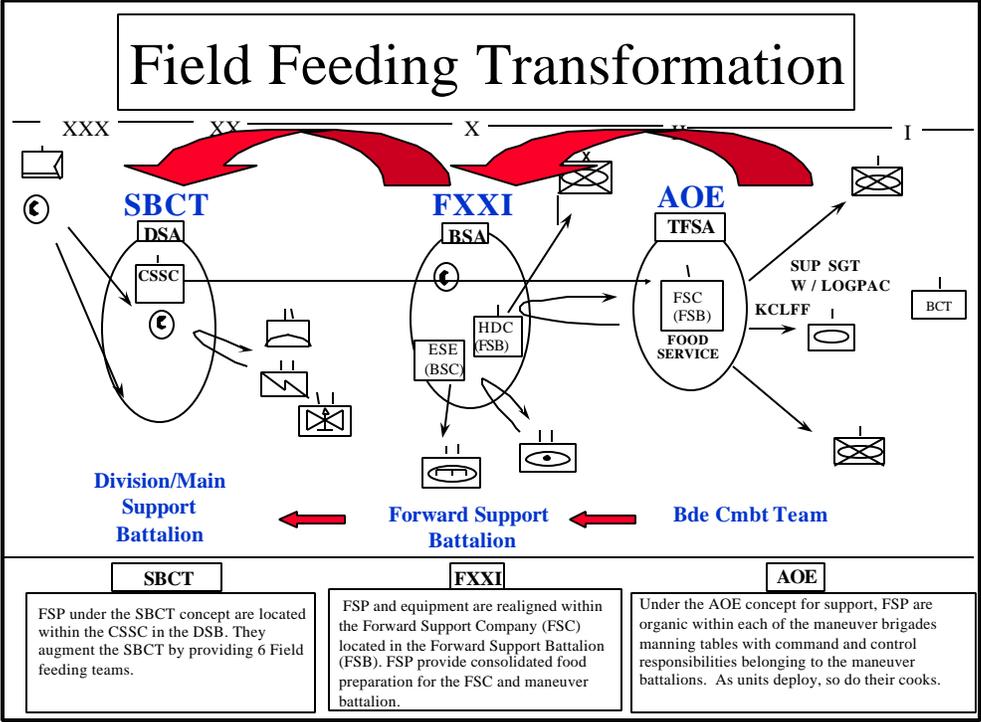


Figure 1. Field-feeding Transformation History

This historical background demonstrates the transformation that field-feeding has undergone throughout the history of the Army. Changes were made to accommodate the war-fighting doctrine of that era by the introduction of new rations, equipment, and force structure realignment. Under each of the previous force structures FSP provided food safety oversight, prepared and distributed rations, operated field-feeding equipment and provided the maneuver commander with the ability to alter feeding plans. Has the

assumption been made that these functions are no longer required. If so, then who will fill the void created? The structure realignment aspect is what is central to the current transformation goals of the Army. Has technology eliminated the requirement for FSP? This type of questions will be analyzed in greater detail in chapter 4.

Secondary Questions

A secondary question concerning this thesis is to determine whether or not the removal of FSP was the right decision. As stated previously, the future force must be agile enough in order to respond to any crisis. With the advent of better rations, longer food shelf life and food service equipment; soldiers are able to sustain themselves for longer periods of time without the requirement for having food service personnel prepare and distribute meals. The question then becomes, has technology improvements eliminated the need for having FSP? Another secondary question concerns whether or not non-FSP can provide the same functions as trained FSP without any degradation in support.

Significance

The significance of this study centers on the efficient employment of food service personnel that will help to achieve Army CSS transformation while also providing the best support to the warfighter. This thesis will attempt to determine if the decision to relocate FSP was the right decision. The intent is to reduce the footprint by reducing the number of CSS personnel required to deploy in order to facilitate both strategic mobility and tactical maneuver without compromising feeding standards. Field-feeding is a combat multiplier that sustains combat power over time by improving morale and enhancing the warfighters physical and mental capabilities. This new concept must be

defined, tested, and refined prior to actually employing the new concept, otherwise the Army fails to support the one commodity that is the most essential to its efforts, the soldier. As stated by leaders in industries across America, change in operating philosophy, structure, and goals is necessary in organizations in order to remain relevant based on the advancements made in technology. The Army's operating philosophy and goals as depicted in the *Army Vision* are well documented, and changes are in full swing across the Army. Structuring the force with the right equipment and personnel is the first step prior to fielding a new force structure. Future battles will be fought against forces in a nonlinear and noncontiguous battlefield, a total different shift on how the Army was trained to fight during the Cold War era. Logistics and the method of support are critical in order for the SBCT to succeed. The *Army Vision* clearly spells out the requirement concerning logistical support. It is now up to the CSS community to either implement a new framework or defend the current feeding concept.

Limitations and Delimitations

Due to the evolving doctrine surrounding future operations, this thesis will be limited in the ability to apply approved doctrine and will be based on proposals and draft doctrine presented to date. The limitation that thesis will take is that support will occur during sustained combat operations only. Excluded from this study are operations other than war (OOTW). OOTW relies primarily on the use of contractors in support of these operations. Contractors supporting OOTW are part of the Army culture and will remain so based on the efficiencies they bring to the battle; therefore, contractors will not be analyzed during this study. Finally, due to the magnitude of the Interim Force to include

on-going changes and the constraint to finish this thesis by April 2003, any doctrinal changes that occur after December 2002 will not be incorporated in this study.

Assumptions

Commanders at all levels will always require a hot meal at D+22 as stated in Army Regulation (AR) 30-22, *The Army Food Program*, where this meal is served is based on METT-TC. The assumption that this paper will take is that the current field-feeding doctrine will remain unchanged when analyzing this thesis. Finally, units at echelons above division will not be studied because the assumption is 92Gs will remain organic within the units and they will continue to provide the support they do today.

Summary

In summary, field-feeding has evolved from soldiers foraging for their own food during the Revolutionary War to what it is now today: a program that has and continues to provide world class support to America's war-fighting force. Transformation within the last fifteen years has centered on the operational strategy of the Army and the employment of personnel in supporting the current strategy. Based on transformation goals concerning the streamlining of CSS personnel, does the SBCT require FSP support? Transformation can only occur once an analyzes is conducted in regards to adopting the new operating philosophy. Does the Army require FSP to support the SBCT? Can the SBCT function without FSP and still meet the Army field-feeding standard? Can the SBCT sustain itself without FSP for up to twenty-one days or more during initial combat operations? Can the SBCT function without having FSP enforce food safety and protection standards? And is this new change flexible in support of maneuver units?

The Army is again changing the operational strategy, and the challenge is to support the force with the, “Right Meal, at the Right Time, at the Right Place utilizing the Right CSS Force Structure.”

CHAPTER 2

LITERATURE REVIEW

Introduction

To facilitate the literature review and answer the thesis question, the survey of literature is organized into subject areas that will address the key problem statement as well as answer secondary questions listed in this study. An understanding of the technological advances with regards to field-feeding must be understood, so that the question on whether or not FSP are required in support of the SBCT can be answered. Included within the literature review are discussions from subject matter experts concerning rations, equipment, and sanitation and protection standards that help in answering the secondary questions. The final portion of this review will include what others have written on this subject in the areas concerning rations, food safety and protection standards, and proposed field-feeding support to the SBCT. The proposed feeding support will provide an understanding concerning the logic for this change. Studies from the US Army Research Institute of Environmental Medicine (USARIEM) provide compelling evidence that will help to answer whether or not operational rations are suitable for sustained operations.

Based on the current documentation concerning the endstate on logistics, most of the logistics information and how food service will be transformed will be covered in briefings obtained from the Combined Arms Support Command, Directorate of Combat Development (CASCOM-DCD) through the use of interviews and briefings. Interpreting FM 43-9.7 *Combat Service Support to the Interim Brigade Combat Team*, will also lend insight to the new proposed doctrine. The Army Center of Excellence-Subsistence

(ACES) is another organization that data will be obtained from since it is the proponent concerning Army field-feeding doctrine. Finally, interviews with field-feeding subject matter experts and former commanders and leaders will be used to gain an understanding if the decision to remove FSP was the best decision.

Research Related to Thesis

There has been very little research conducted concerning field-feeding transformation to include whether or not FSP are required to support the SBCT. The vast majority of transformation information that is used to support this thesis is provided from articles that were written in logistic journals, such as the *Army Logistician* and *Quartermaster Professional Bulletin*. In addition, briefings from the Combined Arms Support Command (CASCOM) have been made available dating back to 1999 when the new vision was first unveiled. Finally, included in this chapter are research papers written by officers at the Command and General Staff Officers' Course School of Advance Military Studies (SAMS).

Lieutenant Colonel Richard Proietto, US Army, wrote a research paper while attending SAMS in 2001 titled "Applying Scientific Research to Optimize Operational Rations: Exploring the Possibilities." Proietto discusses the improvements made in developing operational rations in particularly the MRE. He takes a critical look at the Army's MREs and compares their mix of fuel nutrients to what nutrition scientists believe to be the optimum mix. He mentions in his thesis that although significant improvements have been made with regards to nutritional value, he believes that additional improvements must be made to ensure that the current nutrient mix in operational rations is adequate to sustain soldiers for longer time periods. This insight is

relevant in regards to this thesis because one of the concerns is the ability of soldiers to solely subsist on operational rations. Over prolonged periods of time (twenty-one days) the lack of certain nutrients will not have an effect on the soldier, but over an extended period (twenty-one days or more) the lack of these nutrients will ultimately degrade the soldiers' health. He concludes his findings by stating that the Army's operational rations are far from being optimal because of three primary reasons. First, two of the fuel nutrients, fats and carbohydrates, are not in the right quantities and mix in MREs to make them optimal. Secondly, MREs are also severely lacking in their fiber content. Compared to the United States Department of Agriculture (USDA) recommendations of thirty-five grams of fiber for a 3,600-calorie diet, the MREs 20.75 grams of fiber pale in comparison. Thirdly, recent studies indicate conclusively that the quantities of sodium in MREs are simply too high (Proietto 2001, 5).

Joseph A. Zanchi and Alan J. LaBrode from the US Army Soldier Center of Excellence, Natick, Massachusetts, combined to write an article titled, "Combat Ration Logistics-From Here to Eternity." The article centers on the improvements made in the area of ration storage life, to include nutritional quality and content and packaging. They state that nutritional value has increased by 30 percent over rations that were in the inventory in 1990, but additional improvements are still needed. The new improvements were made to provide soldiers with improved "fuel" that is tailored to increase combat effectiveness and reduce battlefield stress. These technological innovations will not only achieve greater performance capability, lethality, sustainability, and survivability, but also will support transformation strategies that will result in revolutionary military logistics. The nutritional improvements are critical in determining the feasibility of

soldiers subsisting only on operational rations for a period exceeding twenty-one days. The Army Surgeon General has stated that soldiers are able to subsist for twenty-one days consuming only MREs, due to the decrease of essential nutrients required by the human body. The authors in addition lend insight on what will be needed to fuel the force in year 2010 and beyond. They envision a self-reliant, future warfighter and soldier system that, together, is able to make a swift and decisive first strike that is supported by a self-tailoring ration system. Such rations will have components genetically structured to release appropriate energy boosters, neurotransmitter precursors, illness suppressors, wound-healing compounds, and performance-enhancing formulations. These components will be controlled either by the warfighter using a nutritional status monitor or remotely by lasers. Preselected ingredients will be released at the appropriate time via a skin patch to ensure the soldier's optimum response to the combat, environmental, or tactical situation. They conclude by stating that these breakthroughs could conceivably provide a twenty-five percent decrease in logistics requirements, a 100 percent utilization of rations, and a 50 percent improvement in warfighter health and performance when fully developed. These and other similar type of systems are currently under research by USARIEM laboratories (Zanchi et al. 1999).

Major Madeleine S. Rose and Major Dawn E. Carlson from the US Army Research Institute of Environmental Medicine (USARIEM), Natick, Massachusetts, both conducted a research titled, "Effects of A-ration Meals on Body Weight during Sustained Field Operations." The authors collected food consumption and body weight data from thirty-one soldiers in three artillery batteries involved in eight days of sustained operational field exercises. The purpose for this study was to determine whether body

weight loss during field exercises was attributed solely with soldiers subsisting on packaged rations, such as MREs. Comparing the results of the present study with that of recent field studies indicated that soldiers consume more calories and lose less body weight when served three hot A-ration meals and day as opposed to the following meal cycles: two A-rations and one MRE; two UGR-H&S and one MRE; one UGR-H&S and two MREs or three MREs a day. The energy intake of soldiers eating three MREs a day was 2,445 kilocalories and did not meet the lower limit of the Military Recommended Dietary Allowances (MRDA) energy requirement range (2,800-3,600 kilocalories a day) for moderately active military personnel. The soldiers eating two A-rations and one MRE a day consumed 3,271 kilocalories a day, which meet the MRDA for energy. The soldiers consumed more calories when eating two A-rations and 1 MRE than for any other combination of rations. Although the soldiers still lost a modest amount of body weight, this was offset by the amount of calories that were put back into their system. The data collected clearly indicates that soldiers when served hot meals that they like and given the time to eat these meals will consume sufficient calories to maintain energy balance even during sustained, physically demanding field exercises (Rose et al. 1986).

Another research study conducted by USARIEM and documented by Doris E. Sherman is titled, "Nutrient Content of the Meal, Ready to Eat 1988-1999." Sherman states that many changes in ration components and menus of the MRE during the period from 1988 to 1999 were made, but the changes did not have a great impact on the nutrient content of the ration. This report indicates that thirty-one nutrients in the MRE VIII-XIX meals met the Nutritional Standard for Operational Rations (NSOR). Magnesium, zinc, and foliate fell slightly below the NSOR in some versions of the ration, these three

nutrients were recommended for increases in future MRE versions. It also revealed that the fat content of the ration has had a tendency to rise because of the increasing number of fat-containing spreads in the ration. This study lends insight to the lack of nutrients present in MREs to include improvements in nutrient content if soldiers are to subsist for twenty-one days during initial combat operations (Sherman 2002, 3-12).

In a third study conducted by USARIEM the following authors collaborated their efforts to produce a study comparing two different types of rations. Dr. D. E. Roberts, Lieutenant Colonel E. W. Askew, Major M. S. Rose, M. A. Sharp, Captain S. Bruttig, and J. C. Buchbinder combined to write a research paper titled “Nutritional and Hydration Status of Special Forces Consuming the Ration, Cold Weather or the Meal, Ready-to-Eat Ration During a Ten Day Cold Weather Field Training Exercise.” Four teams of Special Forces volunteers were divided into two groups to test the MRE and the Ration Cold Weather (RCW) rations in a field test in a moderately cold environment. Both groups were reported to have lost weight (MRE = 6.9 pounds; RCW = 5.9 pounds) as the average caloric intake was 2,733 kilocalories for MRE group and 2,751 kilocalories for RCW group. The results of this study indicated that although the RCW supported soldier performance in this study similar to the MRE, it offered no improvement in reducing weight loss, increasing calorie intake, or hydration status compared to the MRE. They recommended that a future version of the RCW should maintain the present carbohydrate level, but reduce the sugar content by reducing certain components and include items to encourage fluid consumption. Furthermore, the study recommended that modifications and additional testing are necessary for both the RCW and MRE (Roberts et al. 1987).

Captain John C. Beach, Army Medical Service Corp, wrote an article in May 2000 titled, "Food Safety Diagnostics: Ensuring Safe Food for Soldiers." The author mentions the need for the safe handling of operational rations during field operations. He states that foodborne disease outbreaks are a significant threat to the deployed fighting forces, capable of incapacitating many troops at any given moment. Captain Beach stresses that the Army must actively pursue food safety surveillance programs that conduct rapid, presumptive laboratory testing which can only be accomplished by trained and certified personnel. The importance with understanding food safety standards directly reflects the type of trained personnel available within units who can detect contaminated products; currently 92Gs are trained and certified to ensure that food is handled and stored properly. Entry-level food service soldiers are provided training that enforces food protection and sanitation standards per *Technical Bulletin Medical 530* (TB MED 530). Noncommissioned officers (NCOs) are certified under the both the Army Quartermaster Center and School food protection standard as well as under the commercial industry food protection standard from the National Restaurant Association called ServSafe. This article confirms the need and importance for safe-handling procedures conducted by qualified personnel in order to decrease DNBI on the battlefield (Beach 2000, 2).

Major Albin R. Majewski, CASCOM-DCD, wrote an article in the *Quartermaster Professional Bulletin* (summer 2002) titled, "Field-feeding in the Interim Force and Objective Force." In addition, Major Majewski provides several briefings and white papers that discuss the proposed structure, feeding locations, and method of support for the SBCT. Majewski is a member of the Directorate of Combat Developments for Quartermaster functions within CASCOM. He explains in the article the various

contributions and innovations that have been made in regards to field-feeding and how these efficiencies will help in supporting the SBCT. He discusses the change in relationship with how FSP will be employed and lays out several support options. Majewski compares all three operating environments (AOE, FXXI, and SBCT) based on the current Army field-feeding policy, which requires three quality meals per day (UGR-H&S/MRE/UGR-A). Option 1, (see figure 2) of the SBCT concept follows the current Army field-feeding policy, but the actual ratio increases based on the headcount from 1:35 to 1:37. Only after modifying the feeding policy was a reduction in FSP realized in options two and three (Majewski 2002, 46).

Food Service Structure Comparison

Facts:					
<ul style="list-style-type: none"> • Army field feeding policy requires 3 quality meals per day (UGR H/S-M-UGR A) • CSSC Option 1 concept of field feeding provides the Army standard of food service • Consolidating cooks in the BSA seldom meets the standard <ul style="list-style-type: none"> – Not all soldiers receive a hot meal – Improper field feeding system can cause Disease and Non-Battle Illness (DNBI) 					
	AOE	Force XXI	SBCT CSSC Option 1	SBCT CSSC Option 2	SBCT CSSC Option3
Number of cooks	113	119	104	77	50
BDE Headcount	4001	3782	3791	~ 3571	~3544
Ratio Cooks / Soldiers	1 / 35 serving	1 / 32 serving	1 / 37 serving	1 / 46 srvg 1/2	1 / 70 serving

Figure 2. Food Service Structure Comparison. CASCOM-DCD Brief: Albin Majewski, “Combat Service Support Company: Support for the IBCT in Extended Operations,” Fort Lee (December 1999), chart 19.

In a briefing to General Abrams, TRADOC Commander, from CASCOM-DCD titled, “CSSC, Support for the IBCT in Extended Operations” in December 1999 (see table 1). The briefing lays out three field-feeding options in support of the SBCT. The

decision matrix uses five criteria to determine the best mode of support: equipment and personnel ration cycle and morale, deployability, distribution supportability, and meets current field-feeding doctrine compliance. Option one was revealed to be the best option in two of the five criteria mentioned. The determining factor was attributed to the fact that this option met the current feeding policy. On the other hand, option three was the best option in three of the five categories. This briefing provides various options in support of the SBCT that will help to shape the conclusion for this thesis (Guererro 1999).

Table 1. Comparing Field-feeding Options

	Option 1	Option 2	Option 3
Footprint: Personnel & Equipment (1-3)	104 pers 22 KCLFF-E 6 CK	77 pers 22 KCLFF-E 4 CK	50 pers 22 KCLFF-E 0 CK
	3	2	1
Ration Cycle & Morale (1-3) (Weight x2)	UGR H/S M UGR A	½ BDE H/S-M-H/S ½ BDE H/S-M-A	H/S-M-H/S
	2	4	6
Deployability (1-3)		2	1
Distribution Supportability (except water) (1-3)		2	1
Meets current doctrine (1-3) (Weight x2)		4	6
Totals (Low is Better)	13	14	15

Source: CASCOM-DCD Information Brief titled, “Combat Service Support Company: Support for the IBCT in Extended Operations,” (Fort Lee, CASCOM, 1999), 24.

Major John A. Tokar, US Army, wrote an article in the *Army Logistician* titled “Logistics and the British Defeat in the Revolutionary War.” The significance of this

article is the historical impact logistics has concerning combat operations, the lack of adequate field-feeding procedures and high cases of DNBI can be traced to the Revolutionary War. The lack of control of DNBI was one of many reasons why the British were defeated and which ultimately led to their defeat. The article mentions that the failure of the government in providing adequate provisions was not due to neglect, but to a logistics system that was inadequate and poorly managed. Lessons learned from this article are critical to this study because the Army does not want to repeat this type of failure. By not adequately providing the resources necessary to ensure success on the battlefield, then the Army provides a disservice to its soldiers and ultimately to the success of the operation. This reaffirms the need for qualified FSP within units to ensure food protection and sanitation standards are adhered to.

Summary

Has technology advancements eliminated the need for FSP? Modifications can only occur if the areas concerning nutrition, equipment and food safety have improved to the point that FSP are no longer required. The enclosed literature mentions ration improvements, food protection and sanitation requirements, and changes concerning field-feeding doctrine. The next step is to analyze these and other facts to determine if the SBCT requires FSP to perform field-feeding operations. The SBCT warfighting doctrine calls for a leaner and reduced logistics force structure. With this in mind the question concerning, can the SBCT function without 92G support, can now be fully answered once all the facts and assumptions are gathered and analyzed in a logical manner. The thesis will attempt to lay out supporting evidence on the role that field-feeding personnel will play within the SBCT in a logical and understandable sequence in chapter 4.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to describe the methodology that will be used to analyze the problem statement and determine if FSP are required to support the SBCT. The decision to remove this logistical function and place the personnel within the MSB means that FSP are no longer a part of the brigade combat team (BCT). This thesis will attempt to answer this by analyzing the decision to remove FSP as well as to determine whether or not FSP are required to support the SBCT during sustained combat operations. This will occur by determining if there is a need to have FSP provide support based on logistical and technological advancements (equipment, rations, and food protection).

Once the areas concerning rations, equipment, food safety and protection, and flexibility are clearly defined and addressed in support of the SBCT then the primary question of this thesis can be answered. Based on the fact that this is still a new concept the logistical doctrine to support this concept is limited to briefings, proposed doctrine and white papers from logistical agencies. If the determination is that FSP are not required to support the SBCT, then the question that must be answered is whether non-FSP can perform field-feeding functions?

SBCT Field-feeding Analysis

The analytical methodology used for this study involves two steps. The first is to discuss the proposed structure in order to provide a foundation for all future analysis. Analyzing the proposed doctrine to include briefings that shape this new methodology is a focal point for this thesis. The second step is the evaluation of the analysis using subject areas discussed later in this chapter.

An analysis is not complete without a brief history concerning the three current Army force structures (AOE, FXXI, and SBCT). These force structures were mentioned in chapter one in order to gain a historical background with how FSP provide support within each of the respective forces. Chapter two provides a brief retrospective look on what others have written concerning this subject. Included were discussions on rations, equipment, proposed FSP force structure, and food safety and protection standards. Data for this portion of the thesis were collected from numerous logistical field manuals, briefings, journals, and DOD publications. Interviews with subject matter experts (SMEs) will be used to clarify support issues as well as to gain insight concerning the endstate for field-feeding. Interviews with former combat arms commanders and leaders will also lend insight from a combat arms perspective. Finally, the question concerning whether non-food related personnel can perform this mission will be analyzed when discussing the areas of equipment, food preparation, and food safety and protection.

Evaluation Criteria

The basis for this research is to analyze the proposed field-feeding concept based on four subject areas: rations, food safety and protection, equipment and flexibility. Equipment, rations, and food safety and protection are purely logistical considerations. The fourth subject area, flexibility, analyzes the impact that this decision may have concerning commanders and their ability to employ critical logistics assets in support of their combat mission.

The first subject area concerns operational rations. In chapter 2 several articles and research reports mention the requirement for having nutritionally balanced rations in support of deployed forces. The discussion concerning rations will consider whether or

not soldiers can subsist solely on them for extended periods (twenty-one days or more). A subset within this subject area will consider preparation of operational rations. Operational rations consist of A-rations, UGR-H&S, and MREs. The purpose for this portion of the analysis is to determine if non-FSP can prepare A-ration meals.

The second subject area involves food safety and protection expertise. Analyzing this will help to answer one of the secondary questions: Can the SBCT function without having FSP enforce food safety and protection standards? In addition, the question concerning whether or not non-FSP can perform this mission will also be looked at. A look at the critical tasks required for each FSP will be discussed in relation to whether or not non-MOS related personnel can perform this mission. The importance of ensuring the safe handling of food is documented in chapter two. This and other collected material will be used to formalize a decision.

The third subject area concerns the equipment used for preparing operational rations. A look at the equipment used, to include training required, will be considered when analyzing this area. This criterion will help to answer the following question: Can non-FSP perform this mission?

Flexibility is the fourth subject area that will be used to determine whether or not FSP are required within the SBCT. Flexibility allows commanders the ability to shift and employ assets as needed based on time considerations. This thesis will explore the decision to remove FSP from the SBCT and analyze whether or not commanders have the right structure to support their soldiers. Data obtained through interviews with former commanders and leaders will be used to answer this criterion.

Subject Area Analysis Outline

Listed below is an outline on how the analysis in chapter 4 will flow. While answering each of the criteria both primary and secondary questions will be analyzed and documented in order to obtain a conclusion.

Outline

Primary Question: Does the SBCT require FSP to provide field-feeding support?

Secondary Questions:

1. What are the impacts with not having FSP within the SBCT?
2. Has technology improvements eliminated the need for having FSP?
3. Was the decision to remove FSP the right decision?
4. Can non-FSP provide the same functions as trained FSP without any degradation in support?

a. Rations

- (1) Do the rations in today's inventory provide a balanced and nutritious meal when consumed for twenty-one days?
- (2) Is there an impact on soldiers' morale when only consuming MREs for extended periods of time?
- (3) Can non-FSP prepare A-ration meals?
- (4) What are the training requirements concerning food preparation?

b. Food Protection and Sanitation

- (1) Can the SBCT function without having FSP enforce food safety and protection standards?

(2) Can non-MOS trained personnel enforce food safety and protection standards in support of the SBCT without an increase in risk?

(3) What are the food safety and protection standards that must be met?

c. Equipment

(1) How much training is involved with operating field-feeding equipment?

(2) Can non-FSP operate the equipment?

(3) What equipment is available to the SBCT and the associated number of soldiers to operate it?

d. Flexibility

(1) Is the new change flexible in support of maneuver units?

(2) Does the SBCT commander have the flexibility to alter feeding plans based on the availability of FSP and their associated equipment?

The underlying goal concerning this analysis is to provide the best support to the soldier by not compromising the quality of support previously provided.

Conclusion and Transition

Chapter 2 provides an insight into what others have written concerning rations, food safety and protection, equipment and flexibility in support of the SBCT. Chapter 3 provides the methodology for the analysis of the research question. Chapter 3 also articulates the processes for assembling the information and arranging the data.

Chapter 4 organizes and presents the data to determine whether or not FSP are needed to support the SBCT. Finally, chapter 5 will include a summary and recommendation based on the primary question concerning this thesis. Finally, a recommendation for future research will also be included.

The material presented thus far provides an insight into a possible solution and recommendation on how to best align FSP to support a force that is designed for lethality and quick entry. Evidence obtained and discussed so far provides a foundation concerning the importance placed on field-feeding and in particular the value added by having qualified professionals available on the battlefield. The next step is to package this material in a logical order so that this theory is understood and arguments for and against have a based reference point for future discussions. The outcome should ascertain whether or not FSP are required to support this new force structure.

CHAPTER 4

ANALYSIS

Introduction

Prior to analyzing whether or not FSP are required in support of the SBCT, an understanding of the role FSP provides in supporting troops on the battlefield must be understood. FSP with the 92G military occupation specialty (MOS) are responsible for preparing, cooking, operating field-feeding equipment, enforcing food safety and protection standards, and distributing meals. They provide three quality meals a day to US forces in garrison and in the field. Their main role during field operations is to prepare and distribute meals, setup equipment, enforce food safety and protection standards, and advise commanders on field-feeding options (FM 10-23 1996). The importance of ensuring the safe handling of food is attributed to eliminating foodborne illness on the battlefield, which if not handled properly, can be a detriment to unit combat readiness. History has indicated that disease and nonbattle injuries is a leading cause in rendering a unit combat ineffective. This subject will be discussed in greater detail later in this chapter. Food safety and protection, which helps to control DNBI is one of the subject areas that will assist in answering the question on whether or not FSP are required in support of the SBCT.

The analysis begins by discussing the background information related to the decision to transform the brigade combat team, in particularly the decision to relocate FSP. Analyzing what the Army intends to accomplish and the logic used might reveal what may or may not be required in the future.

Proposed SBCT Field-feeding Concept

The proposed feeding plan for the SBCT calls for a platoon leader and 103 FSP assigned to the field-feeding platoon that is part of the Combat Service Support Company (CSSC). One CSSC is allocated for each SBCT and is assigned to the Division Support Battalion (DSB). The CSSC is designed to facilitate the modular employment of any or all of its elements (figure 3, CSSC Field-feeding Teams). The CSSC was designed to specifically support the SBCT and is also a battle space multiplier in support of the SBCT. When fully deployed in support of the SBCT, the CSSC provides:

1. Command and control for units organic or assigned to the CSSC.
2. Supply support augmentation to include Classes III(B) and IX.
3. Food service support to personnel assigned or attached to the CSSC and Brigade Support Battalion (BSB).
4. Transportation platoon scaling to increase distribution capability of the BSB.
5. Field maintenance scaling to increase the maintenance capability of the Brigade Support Company (BSC).
6. Field-feeding augmentation to the SBCT.

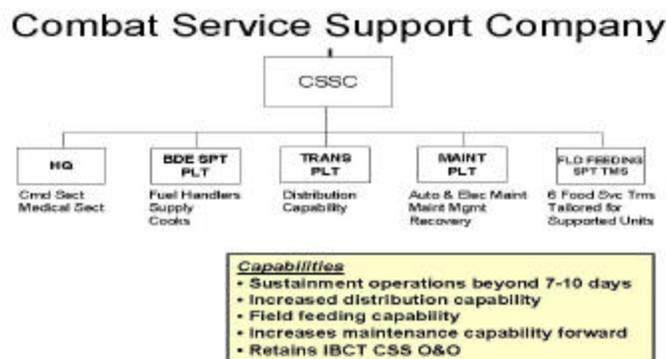


Figure 3. The CSSC Organization. Theater Logistics Handbook, Army Transformation, (Fort Lee, CASCOM, May 2002): 5-19.

The 103 cooks (table 2. SBCT MTOE) are organized into six field-feeding teams to support the six battalion-sized units that makeup the SBCT. The cooks augment the SBCT, which means they provide a capability not organic to the SBCT. Augmentation is defined as the addition of a capability not previously existing within an organization (FM 4-93.7, 2002, 3-39).

Table 2. SBCT MTOE

		Para 2	Para 3(x3)	Para 4	Para 5
SR FOOD OPNS MGMT NCO	E7 92G4O	1	1	1	1
SR FIRST COOK	E6 92G3O	2	2	1	2
COOK	E5 92G2O	3	4	2	3
COOK	E4 92G1O	7	7	3	5
COOK	E3 92G1O	5	6	3	4
Paragraph		18	20	10	15
					103

- Paragraph 2 = Brigade and RSTA
- Paragraph 3 = Infantry (x3)
- Paragraph 4 = Field Artillery
- Paragraph 5 = Brigade Support Battalion

Source: Information Brief on the Stryker Brigade Combat Team Mission and Organization from CASCOM-DCD-QM, (Fort Lee, CASCOM, 2003), 7.

Another important question with regards to this research concerns whether or not the shifting of logistics personnel in order to streamline force structure will have an effect on the Army field-feeding standard. By proposing this change has the Army leadership already concluded that FSP are not needed? Once the SBCT deploys they will receive augmentation no later than D+20 from the CSSC (see figure 4). Between D-day and D+3 units will consume their basic load of MREs. After D+3 soldiers will continue to receive

MREs in unit configured loads until D+20. Is it reasonable to assume that soldiers can subsist solely on MREs during this time frame? The feeding proposal for the SBCT has not been published. Due to the nutritional concerns with MREs discussed in chapter three the assumption that will be made for the purpose of this study is that three quality meals with at least one hot meal must be served each day, METT-TC dependent as prescribed by the AFFS (AR 30-22, 2002). This is the same standard that is currently enforced for the entire force.

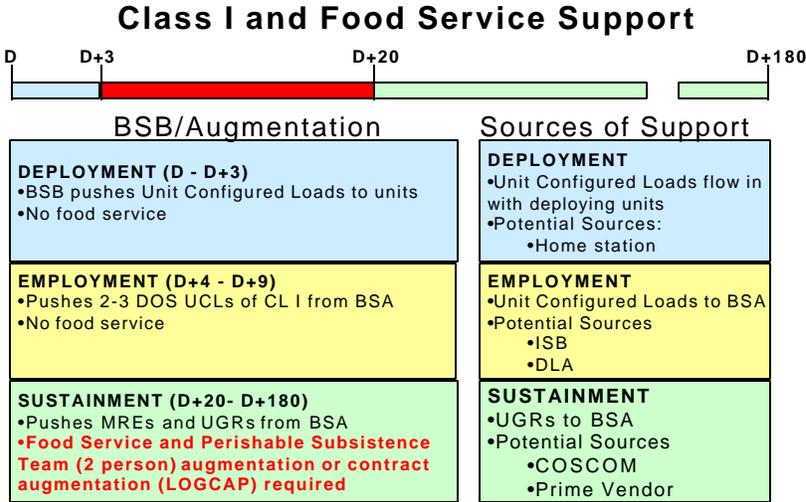


Figure 4. SBCT Class I Deployment Timeline. Information Brief on the Interim Brigade Combat Team, (Fort Lee, VA, CASCOM-DCD, April 2002).

Subject Area 1: Rations

The decision made to relocate FSP does not adhere to the policy set forth in AR 30-22 stating that at least one meal must be an A-ration; based on METT-TC. This portion of the analysis is designed to determine whether or not MREs are consumable for

a period of up to twenty-one days or more without any degradation of essential nutrients and body weight loss. How FSP fit into this equation will be determined by analyzing whether or not A-rations and UGR-H & S rations can only be prepared by FSP. This aspect will be discussed at the end of this subject area.

The MRE is the current standard operational ration for the individual US military warfighter in the field. It contains food components that are ready to eat and do not require preparation except for the reconstitution of the powdered beverages. Packaging is designed to be lightweight, flexible, and suited for portability. MRE meals are packaged twelve to a case to provide a variety of menus, interchangeable for breakfast, lunch, and dinner. The first version of the ration, MRE I, was fielded in 1981, with other versions of the ration produced each following year (AR 30-22).

Combat operations in which the fighting continues for twenty-four hours or longer are defined as sustained operations. Soldiers participating in sustained operations should have higher energy requirements because they are active for a longer portion of a twenty-four hour period (Carlson and Rose 1987). SBCT operations are characterized by continuous sustained operations for a period of 7-10 days in duration. Army Regulation (AR) 40-25, *Army Nutrient Standards*, states that at a minimum 3,600 calories with no more than forty percent calories from fat are required for soldiers operating in a field environment (AR 40-25 2001). In addition, as mentioned previously in chapter 2, the MRDA recommended energy requirement range for moderately active military personnel lies between 2,800 and 3,600 calories per day. The study conducted by LTC Proietto mentions that healthy fats, omega three and monounsaturated fats, are basically nonexistent in MREs because there is no requirement for contractors to include them in

their recipes. He also states that this is one of the three reasons why MREs are far from being the optimal ration. The other two reasons are based on the quantity and mix of carbohydrates and high sodium content (Proietto 2001).

Although the Surgeon General (TSG) has stated that twenty-one days is the maximum allowable number of days that soldiers can subsist purely on MREs, this does not coincide with the Army field-feeding standard that one meal must be an A-ration meal. Although the Surgeon General is the higher authority concerning nutritional matters, the Army Field-Feeding standard provides a guideline for ensuring that the right meal is provided at the right time and location.

Research conducted by the US Army Research Institute of Environmental Medicine (USARIEM) indicates that the lack of essential nutrients required by the human body decreases body weight more rapidly when subsisting on MREs. Magnesium, zinc, and foliate, as indicated by Doris Sherman in her research, fell below the daily recommended allowance as prescribed by the Nutritional Standard for Operational Rations (NSOR). In another study conducted by USARIEM, the findings determined that soldiers after only eight days of sustained operational field exercises were diagnosed as having lost weight during this short time period when only consuming MREs for a total caloric intake of 2,445 calories (Rose and Carlson 1987). Caloric intake increased by 215 calories to 2,660 when a UGR-H & S meal was added (see table 3. Caloric Intake). As additional hot meals (T-ration, B-ration or A-ration) were added the caloric intake continued to rise by an average of 206 calories after one additional hot meal was added to the ration mix.

Table 3. Caloric Intake of Recent Ration Studies

Ration Type	Ration Studies	
	HIRSCH et al.	CFFS-FDTE(1)
3 MREs	2189	2445
1 T-ration/2 MREs	NS	2660
2 T-rations/1 MRE	NS	2725
2 B-rations/1 MRE	NS	2760
2 A-rations/1 MRE	2950	3271

NS= Not Studied

Source: Madeline Rose and Dawn Carlson, *Effects of A-Ration Meals on Body Weight During Sustained Field Operations*, Natick, MA, USARIEM, (October 1986), 4.

Table 4 indicates that the percentages of calories from protein, fat and carbohydrate have fluctuated slightly over the years with the percentage of calories from protein showing the most consistent pattern of change. Protein as indicated within the table has tended to decline over the years. The same pattern is apparent when the protein content of the ration is expressed as a percentage of calories. This tendency was mainly due to the lower levels of protein in the entrees, especially the vegetarian entrees in the later versions of the ration. The fat content of the MRE has shown a tendency to rise due to the spreads offered in the menus. The percentage of fat containing spreads has increased from 67 percent in MRE VIII-XIV to 75-85 percent for MRE XV-XIX, which is an overall increase from the earlier version of MREs. On the other hand, the MRE consistently met the NSOR for carbohydrates (Sherman 2002). The study concluded by

stating that soldiers under these conditions cannot effectively operate at high levels without the proper nutrients provided by a balanced meal cycle.

Table 4. Percentage of Calories from Protein, Fat and Carbohydrate

MRE Version	Protein	Fat	Carbohydrate
VIII & IX	14	34	52
X	14	34	52
XI & XII	14	34	53
XIII & XIV	13	37	50
XV	13	38	49
XVI	12	34	54
XVII	12	36	52
XVIII	12	37	51
XIX	12	37	51

Source: Doris E. Sherman, *Nutrient Content of the Meal, Ready-to-Eat 1988-1999*, Natick, MA, USARIEM, (October 2002), 6.

In an after action report (AAR) conducted by USARIEM while visiting soldiers forward deployed in Afghanistan, the following comments were made by members of the 101st ABN DIV (Air Assault) (Dean, 2002).

- 83% of Soldiers reported that MREs generally met their nutritional needs while on operations.
- 84% of Soldiers stripped down their MREs in order to carry only the essential components. Soldiers averaged 8-day missions on stripped down MREs.
- Due to the high altitude of these operations (8000-9000 feet), soldiers asked for meals or supplements that contain more calories.
- Soldiers asked for more finger foods that they could eat on the move.
- Soldiers stated that the flameless ration heater does not work well at high altitudes.
- Soldiers stated that they need a way to heat water for hot drinks and that they need their heat tabs back.
- 52% of the Soldiers stated that they would like an individual stove for heating drinks and meal items.

- 57% of the Soldiers stated that they would like an Assault Ration that is lighter and smaller than the MRE.

These comments by soldiers currently deployed as well as research conducted by the Army's scientific community clearly indicates the need for improvements with the current version of MREs. The one constant recommendation throughout this research was the need for a hot meal that contains more calories. Bullet number two from the AAR referencing eight days of stripped down MREs, if applied to the study conducted by Rose and Carlson, (table 3), would conclude that nutrient content would not be sufficient. These soldiers would be consuming less than 2,445 calories based on the evidence depicted in table 3, when not consuming 100 percent of the MRE. Therefore, providing three MREs a day would not ensure adequate consumption of calories to maintain energy balance and optimal muscle glycogen stores of soldiers involved in sustained operations that would effect body weight (Rose and Carlson 1986, 36).

Hot A-ration meals are more acceptable to soldiers than other types of current rations (UGR-H & S, and MRE) as indicated by consumption data found in the research analysis (see table 3). The various studies indicated that troops when served hot meals that they like and given the opportunity to eat would consume enough food to maintain energy balance even during sustained operations. Prolonging the arrival of FSP or permanently eliminating FSP and therefore the possibility of hot A-ration meal could contribute to soldiers losing body weight unless the calorie rates of the current rations can be improved (Rose and Carlson 1987). Although not studied, an A-ration with UGR-H & S and MRE would be the ideal daily meal combination that would provide the minimum 2,800 calories required based on the average increase computed from table 3. This was

determined by calculating the average increase per five separate iterations when an additional hot meal was added to a meal combination. When an UGR-H&S meal was added to the mix, the caloric intake increased by 215 calories. When an A-ration meal was added the caloric intake increased by 311 calories from the base start point of 2,445 (three MRE meals). After calculating these figures ($2,445 + 215 + 311 = 2,971$) the assumption made was that soldiers would receive 2,971 calories per day.

Operational rations within the last ten years have undergone major improvements in shelf stable life and nutritional value. The future inventory will not only include MREs, but high performance rations. Rations available to the warfighter in the future will consist of the Compressed Meal (CM) and the Remote Unit Self-Heating Meal (RUSH-M). The CM will be hydrated with hot water that has been generated on the Future Combat System Vehicle. The RUSH-M is envisioned for smaller units (Special Operations, Signal, Recon Surveillance Teams) that will not see cooks on a regularly scheduled basis. Hot prepared meals (UGR-A & UGR H&S) will be prepared during mission staging phase of operations (deliberate/time dependent). UGR H&S, the replacement for the T-ration in fiscal year 2000, will be provided during replenishment sustainment (hasty or pit stop operations). To support these pit-stop operations the Army is looking at a system similar to the Marine Corp Tray Ration Heater System (TRH-S). The TRH-S is designed to allow cooks to prepare rations on the move; this system is mounted on a HMMWV and provides the war-fighter with a hot meal rather than a MRE (Majewski 2002).

If rations are prepackaged and only need to be heated, opened, and served, then experienced cooks are not needed and significant manpower savings can be achieved.

However, to be fully effective, combat rations must provide nutritionally balanced, wholesome, and appetizing meals that will be consumed in sufficient quantities to meet the nutritional demands of the soldier in the field (Askew et al. 1987). The operational rations as reported by USARIEM studies mention that additional upgrades in nutrient content are required for them to become the sole source of subsistence on the battlefield. Until MREs or other sources of operational rations fully meet the NSOR standard then they should not become the sole feeding source during sustained operations. This discussion on rations to include research obtained from others indicates that the MRE is suitable for only eight to ten days in duration. Not serving a prepared hot meal in the SBCT could result in nutritionally deficient soldiers that are not 100 percent physically ready for combat.

Food Preparation Analysis

This portion of the subject area will analyze whether or not non-FSP are capable of preparing A-ration meals. Currently, FSP receive eight weeks and two days of training covering forty-four critical tasks prior to graduating and being assigned to a unit, see table 5 concerning critical tasks:

Table 5. 92G Food Service Specialist Critical Task List

1. Maintain Safety Standards
2. Retain Nutrients in Food Products
3. Perform Preliminary Food Preparation Procedures
4. Prepare and Cook Meat, Poultry, and Seafood
5. Prepare and Cook Vegetables
6. Prepare and Cook Fillings, Icings, and Glaze
7. Prepare and Back Bread Products
8. Prepare and Cook Egg Products
9. Prepare and Cook Cereal, Rice, or Pasta Products

10. Prepare Beverage Products
11. Prepare and/or Cook Sandwiches
12. Store and Use Leftover Foods
13. Prepare or Cook Salads and Salad Dressings
14. Prepare and Cook Soups, Sauces, and Gravies
15. Prepare Desserts and Pastries
16. Store Subsistence Items
17. Check Subsistence Supplies for Quantity and Condition
18. Operate the Modern Burner Unit and M2 Burner Unit
19. Use and Maintain the Insulated Food Container
20. Set Up, Operate, Maintain, and Prepare the Mobile Kitchen Trailer for Movement
21. Set Up, Operate, Maintain, and Prepare the Kitchen, Company Level Field-feeding (KCLFF) For Movement
22. Set Up, and Maintain the Water Sterilizing Bag and Strike the M1948 Kitchen Tent
23. Perform Cleaning and Sanitation Services at a Field Kitchen Site and a Garrison Dining Facility
24. Store, Prepare, and Serve Operational Rations
25. Prepare Meals for Remote Site Feeding
26. Perform Operator Maintenance on the M2 Burner Unit
27. Apply Food Protection Measures in a Dining Facility and at a Field Kitchen Site.
28. Operate and Maintain the M59 Range Outfit
29. Operate and Maintain the Immersion Heater
30. Operate and Maintain the Gasoline and Propane Lanterns
31. Setup, Operate, Maintain, and Prepare the KCLFF-E for Movement
32. Setup, Operate, Maintain, and Prepare the Sanitation Center for Movement
33. Operate and Maintain the Modern Burner Unit with 2KW Generator
34. Setup Serving Lines and Serve Food at a Field Kitchen Site
35. Setup Serving Lines and Serve Food in a Dining Facility
36. Operate and the Maintain the Mixing Machine
37. Operate and Maintain the Heavy-Duty Range
38. Operate and Maintain the Conventional and Convection Ovens
39. Operate and Maintain the Coffee Urn
40. Operate and Maintain the Deep Fat Fryer
41. Operate and Maintain the Griddle and the Tilt Grill
42. Operate and Maintain the Meat Slicing Machine and the Vegetable Cutter
43. Operate and Maintain the Steam Cooker
44. Perform Sanitation Services in a Dining Facility

Source: United States Army Quartermaster Center & School, 92G10 Program of Instruction (Fort Lee, VA, CASCOM, 2002).

The sixteen critical tasks above (2-15 and 24-25) are directly related to preparing A-ration meals and encompass 160 instructor contact hours. Without these skill sets, soldiers are not capable of preparing meals according to set Army feeding standards. When preparing meals, nutrition and safety standards are enforced throughout the process. The training is setup in a sequential order to allow for refinement of tasks learned during early stages of training. Prior to proceeding to the field-feeding training site an understanding of preparing, cooking, safety and protection measures must be comprehended and practiced. This list reflects required skill sets that must be practiced daily, so that these skills are retained for use in a field environment. Cooking meals for over 700 soldiers per battalion requires an understanding of proper meal preparations, portion sizes, safe handling procedures, and proper storage levels as indicated by the amount of training required by the critical task list (see table 5). Unlike the KCLFF, which only requires heating prepackaged meals, the containerized kitchen (CK) and mobile kitchen trailer (MKT) involve cooking A-ration meals that are not prepackaged. Detailed preparations that only a trained cook would receive during AIT are a must. Preparing A-ration meals on a MKT would require a minimum of four soldiers to devote at least five hours each day in the preparation of one meal (FM 10-23 1966). The rationale for using other than FSP to perform this function is not justifiable because soldiers will be removed from the battlefield to conduct a CSS function. Having non-FSP soldiers properly trained and assuming food preparation roles could lead to deterioration in one or more warfighting skills required of them. The Army cannot afford to have soldiers perform two functions on the battlefield without accepting less than 100 percent

from one of the two skill sets. Accepting anything less could lead to compromising the mission.

In summarizing the analysis concerning rations, MREs are currently not at the desired nutritional level for consumption for up to twenty-one days or longer. In addition, A-ration meals, as indicated by various studies, currently provide the required calorie intake needed during sustained operations. Therefore, until MREs or other operational rations meet the required NSOR, an A-ration combined with a UGR-H&S will be required to enhance feeding plans. Finally, FSP require constant training to prepare meals based on the amount of training involved. Table 5 provides a glimpse concerning the magnitude of the required tasks that must be performed by FSP. When the Army is willing to send soldiers to an eight-week course to obtain these FSP skill sets and an additional fourteen-week course (Infantry One Station Unit Training Course) to train on their combat specialty, will we have soldiers prepared to perform double occupations. There are inherent risks that the Army must be willing to assume if this occurs particularly in duty performance and that is a soldier who doesn't have the time to do either specialty at 100%. The next subject area will analyze the food safety and protection requirements as it pertains to having non-FSP execute this function.

Subject Area 2: Food Safety and Protection

One of the main causes of DNBI during operations is foodborne illness. Foodborne illness is a disease that is carried or transmitted to human beings by food. All food service operations have the potential to cause foodborne illness through errors in receiving, storing, preparing, and serving food (National Restaurant Association 1995, 6). The Center of Disease Control and Prevention estimates food-borne illness strikes

seventy-six million people each year. More than 300,000 are hospitalized and 5,000 die each year due to this illness (Rhem 2000). The two most common symptoms are vomiting and diarrhea. Stomach cramps, fever, muscle pain and headaches are also possible symptoms. Illness causing bacteria thrive in certain environments, particularly moist surfaces between 40 and 140 degrees Fahrenheit. The article by Rhem mentions bacteria breeds in raw or processed meat, poultry, seafood, and dairy and egg products. Even safe, ready -to-eat foods (MREs and UGR-H&S) can become cross contaminated with bacteria transferred from raw food products, meat juices, food preparation equipment or as a result of poor personal hygiene. Having soldiers consume only operational rations in a theater of operations would minimize the threat of a food-borne outbreak. Class A-rations, particularly locally procured food items, present the highest danger as a source of food-borne disease (Beach 2000). The following is a list of the most frequently cited factors that are the causes for foodborne related incidents:

1. Failure to properly cool food.
2. Failure to thoroughly heat or cook food.
3. Infected FSP who practice poor personal hygiene.
4. Foods prepared a day or more before they are served.
5. Foods allowed to remain at bacteria-incubation temperatures.
6. Failure to reheat cooked foods to temperatures that kill bacteria.
7. Cross-contamination of cooked foods with raw foods, or by employees who mishandle foods, or through improperly cleaned equipment.

The causes cited above coincide with the critical training tasks (CTT) that all entry-level FSP receive during advanced individual training (AIT) to include follow-on

unit training. CTT item numbers from table 5 (1, 16, 17, 23, 27, 32, and 44) depicts those tasks that are directly related to food safety and protection training.

Food service sanitation means wholesome food, handled and prepared in a way that the food is not contaminated with disease-causing agents. In other words, sanitation is what helps food stay safe. This is a fundamental creed that all FSP are trained to obey in their daily operating environment. FSP receive extensive training throughout their career in order to ensure the safe handling of food. Over forty hours of training are required for supervisors and cooks so that DNBI does not occur within their respective units. The training they receive at the institutional level continues while on duty and is reinforced daily by food service leaders while on the job.

When asked if non-FSP are capable with enforcing and ensuring food protection and sanitation standards, the food service advisor for the 296 BSB 24th ID, CW2 Marva Ferrell, replied:

When it comes to sanitation it is hard enough of a job to keep food service personnel focused on ensuring sanitation standards are met. I can't imagine trying to have infantry soldiers follow sanitation procedures on a daily basis as well as perform their daily mission. Not having FSP would definitely increase DNBI. (Ferrell 2002)

An example relating to these comments is illustrated in an AAR from Operation Enduring Freedom (OEF) dated November 2002. The article stated that over 100 U.S and coalition soldiers at the Kandahar air base in southeastern Afghanistan came down with mild food poisoning after reportedly eating bad turkey stuffing for Thanksgiving. An Army contractor serving in the region prepared and served the meal with FSP oversight. This is one of two instances that has occurred within the region that has affected deployed troops (CNN 2002). Although this incident occurred with FSP overseeing this

operation, the risk with not having trained personnel on-hand could have been even greater. Incidents like these can cripple an Army especially while undergoing critical operations throughout the world. Is this a risk the Army is willing to assume by not having FSP?

Training Bulletin Medical 530 (TB Med 530), which is the governing Army publication concerning food safety, states that FSP are required to attend a formal certified training program in food sanitation. This training must be equivalent in content and scope to the Education Foundation of the National Restaurant Association's *Applied Food Service Sanitation* course. FSP must pass a written test for certification as a Food Service Manager. They must renew training certification every four years or complete twelve hours of continuing education approved by the medical commander or designated representative. The Surgeon General (TSG) recognizes the following training courses as certifying programs:

1. Education Foundation of the National Restaurant Association's Applied Food Service Sanitation course (SERVSAFE).
2. Quartermaster Center and School's *Food Service Sanitation Course* to include distance-learning course.
3. Educational Testing Service/Defense Activity for Nontraditional Education Support's (DANTES) *Food Protection Certification Program*.
4. AAFES's Food Service Supervisory Sanitation Program

Entry-level personnel receive a minimum of eight hours-introductory food sanitation training within thirty days of beginning food service duty. All FSP will receive a minimum four-hour annual food sanitation refresher training that may be accumulated

over the one year time period (TB MED 530 2002). The purposes for this training is to ensure that FSP are receiving training from a credible source so those standards across the Army mirror each other. The effects of food-borne illness can render a unit ineffective and could possibly compromise operations. Another case in point occurred at Fort Bliss, Texas during 27 August through 1 September 1998 when 99 of 835 soldiers (twelve percent) in one unit were hospitalized for acute gastroenteritis (AGE). Their symptoms included acute onset of vomiting, abdominal pain, diarrhea, and fever. AGE is defined as three or more loose stools or vomiting within a twenty-four hour period. Interviews with foodhandlers in the base's two dining facilities revealed illness in a confection baker, who had become ill while baking crumb cake, pie, and rolls on August 26 (MMWR Weekly Magazine 1999). Incidents like this occur every year, but they go undocumented because of the lack of knowledge by those infected. No food service operation is 100 percent risk free; both outbreaks mentioned in this paper occurred under the watch of trained Army FSP. Without FSP the possibility exists that incidents like this could occur more frequently.

In summary, there is no compelling evidence that suggests non-FSP are not capable of providing this function in support of their units. However, those that have dual responsibility must attend monthly training and mandatory yearly safety training to ensure new tactics, techniques and procedures are followed and understood to mitigate the risk of DNBI that could render a force ineffective. The next area covered concerns the feasibility of having non-FSP operate field-feeding equipment.

Subject Area 3: Field-feeding Equipment

Does the equipment mentioned in this segment for use within the SBCT require a trained cook or can non-MOS trained personnel fill this void? The first major piece of equipment that will enhance operations within the SBCT is the Containerized Kitchen (CK). The CK will reduce the logistics footprint by fifty percent by replacing the current mobile kitchen trailer (MKT) on a one-to-two (and possibly a one-to-three basis). The CK also provides a better cooking environment where cooks can prepare 800 A-ration meals three times daily in support of 3,500 SBCT soldiers.

The KCLFF, with HMMWV and high mobility trailer (HMT), provides the feeding capability forward within the Brigade Support Area. The limitation with the KCLFF is that it is only capable of preparing UGR H&S meals, but it does provide the soldier on the ground a hot meal with supplements. One major advantage for using the KCLFF is based on the small footprint required to transport and operate in forward operating areas. The KCLFF can be either transported by HMMWV or by the family of medium tactical vehicles (FMTV). Doctrinally, the KCLFF requires one trained cook and two non-food service personnel to set-up, prepare, and distribute meals at each company level. If properly trained non-FSP could possibly operate this piece of equipment provided that all prerequisites for training, operations and safety are met. Table 5 lists twelve tasks that directly relate to operating field-feeding equipment (tasks 18-22, 26, and 28-33).

FSP receive 120-instructor contact hours covering seventeen critical tasks of knowledge and skills required to operate and maintain field-feeding equipment. During this phase of training, trainees are introduced and taught to prepare operational rations,

and maintain and operate field-feeding equipment, while reinforcing sanitation, nutrition, and safety. The MKT is a mobile kitchen with much of the same characteristics found in a normal dining facility. A soldier will need repetitive training and exposure to the equipment to reinforce the skill sets necessary for operations. Leaders must ensure that soldiers designated to conduct field-feeding operations receive mandatory training in both of their warfighting and CSS occupations.

In conclusion, non-FSP can be trained to operate any of the field-feeding equipment within the Army inventory. Having non-FSP operate field-feeding equipment would reduce the amount of personnel required to deploy in support of the SBCT. The SBCT would then meet the CSA goal of having an agile and reduced logistics footprint. Ultimately, the Army must be willing to sacrifice combat manpower by having non-FSP prepare meals instead of performing their combat mission. When the level of risk is defined, only then can the Army implement this dual role system.

Subject Area 4: Flexibility and Morale

Does having FSP with equipment capabilities in units allow commanders the flexibility to employ various options while supporting soldiers forward deployed. Some options available to commanders with assigned FSP could include the following: preparing food in the brigade support area (BSA) or the battalion field trains and sending the food forward on the logistics packages (LOGPAC) for serving at the company trains or sending one cook, equipped with the KCLFF, forward to the FLOT to support each maneuver company or forward task force's feeding requirements. This second option provides a choice between cooking some of the food at the battalion field kitchen and completing the meal with limited food preparation forward in the company trains or

cooking entire meals such as the UGR-H&S forward. The commander controls these arrangements through an approved field-feeding plan normally developed by the appropriate food advisor assigned to each BCT. These are some of the various options that can be implemented based on the operational tempo assuming that the resources mentioned above are available within the unit. Chief Warrant Officer Three Reginald Griffin, instructor at the QMC&S, emphasized the following:

The greatest impact is that the maneuver commanders (down to BN and CO level) do not have the flexibility to change and govern menu cycles based on operational mission. Coordination must be accomplished through the BSB and CSSC who may or may not have visibility of the unit's mission. Cooks provide the maneuver commander the flexibility to govern and change meal schedules to meet the mission requirements at a moments notice. (Griffin 2003)

Colonel (Retired) Charles Soby recommended that units deploy with a KCLFF so that at a minimum a hot meal provided by an UGR-H&S can be prepared thus alleviating the burden of only consuming MREs. This would bridge the gap between first echelon deployment forces and unit closure. In addition, this added flexibility would allow units the ability to alter feeding plans and implement hot meals as mission dictated. Having this flexibility would also help to improve morale until the CSSC arrives in the theater of operations (Soby 2003). He stated, that as a commander of a field artillery brigade he noticed that the morale of the soldiers would decrease after only a few days when not consuming a hot meal. Commanders have indicated that, at a minimum, having a KCLFF while deployed would be sufficient to meet the immediate needs with providing a hot meal. Although as mentioned previously, two UGR-H&S combined with one MRE would still not meet the minimum MRDA calorie intake (2,800 vs. 2,725), it does increase the total intake when compared to three MREs (2,445). This at a minimum

allows commanders to provide soldiers a hot meal when the mission dictates and not based on the arrival of the CSSC.

Interviews conducted with former commanders and leaders suggest that consuming MREs for up to twenty-one days or more is both a morale and health issue. The soldiers' will to fight is not what is being questioned, but their motivation to provide their best at all times which means their physical well being must be cared for. This is an area that is not easy to measure, but one that is clearly visible by the attitudes and actions that soldiers portray.

Two different studies discussed earlier indicated that after eight days of sustained training the body nutrient content and morale of the soldier starts to deteriorate. Morale is one of the areas that is hard to measure, but an area that commanders cannot take for granted. The A-ration will remain the ration of choice to improve and maintain the morale of our warfighters. Reality has shown that commanders, whether in training or deployed want to serve A-rations to their soldiers as soon and as often as possible because of the positive impact it has on morale. Major General David Kratzer, Commander, 377th Theater Support Command, emphasized how morale played a part within his unit when he commented,

I was the commander of military operations in Afghanistan. I will say that when we were able to change and go to UGR-As, the difference especially at the breakfast meal was measurable. I could see it in the attitudes of the soldiers. It really impacted the way they felt about their work, and the way they felt about the day that was coming up. (Kratzer 2002)

Hot meals are one of the few luxuries that soldiers experience while in a field environment. Having hot meals improves the soldiers' morale, but more importantly vital nutrients are being replenished

Lieutenant Colonel David Gruenwald, former aviation brigade executive officer in the 101st ABN DIV (Air Assault), stated that flexibility is of concern to him by not having organic CSS resources at his disposal within the unit. He also mentioned that there are three elements that must be closely linked so that this concept does not fail when operations do occur. Communication, cooperation and coordination are areas among the supported and supporting unit that must be closely linked so that operations are successful. This is a vital and often overlooked aspect, having maneuver units and CSS units training together. The benefit with having units' train together in garrison as well as within the field will ensure that plans are synchronized during actual operations. Esprit-de-Corp is another area that he feels may be lost by not having units working and living together on a daily basis (Gruenwald 2003).

An interview conducted with a former commander of the 3BDE, 4th ID, Colonel (Retired) Dan French, revealed the following insights. He stated that the focus in the Army is to fight within BCTs since it is the center of the Army's warfighting doctrine. For the BCTs to be successful they must have the resources available from day one so that commanders have the added flexibility with ensuring that their units are equipped and provide the level of support required to succeed. In addition, Colonel French provided these comments concerning soldiers' morale:

Seventy percent of combat is morale. Anything we take away from the soldier affects morale and could affect operations. This occurred in Operation Just Cause; soldiers were fed MREs for as much as two weeks at a time. The morale of every soldier suffered as well as attitudes because they felt that the Army was not taking care of them. Soldiers know what is available to them and the Army owes it to them to give them the best support when available. (French 2003)

French concluded by saying that having FSP within his unit ensured that they trained as a team both in garrison and in the field. FSP in his unit understood the overall mission and they anticipated changes in the mission by being proactive while in the field.

Leaders and former commanders stated during the interview sessions that having warfighters fill a CSS function would reduce the combat power within their units. This portion of the analysis provides an insight to the value placed on having FSP within the BCTs and the effects concerning morale. Having a high level of morale in units only increases the level of performance.

Conclusion and Transition

The analysis discussed provides a glimpse concerning the answer on whether or not FSP are required to support the SBCT. Answers to some of the subject areas indicate that FSP are not required. Any non-FSP can perform field-feeding operations provided they receive the mandatory training. For this to occur there are certain risks and assumptions that must be addressed and answered. Is the Army willing to wish away critical CSS functions for the sake of eliminating FSP? These types of questions will not be answered in this thesis, but the assumptions and risks will be addressed in the final chapter. The next chapter will provide a summary of the findings and provide a recommendation concerning whether or not FSP are required to support the SBCT. Consuming only operational rations without class A-rations (freshly prepared food) supplementation would create serious nutritional problems. On the other hand, not having FSP coupled with only providing MREs for the first twenty-one days would reduce the amount of personnel and supplies required in a theater of operation. This would in effect meet the deployment timelines and reduce force structure as the Army transforms to a

lighter more mobile fighting force. These issues pose a dilemma concerning the primary question pertaining to having FSP within the SBCT. The Army must define the level of risks that it is willing to take if the decision is made to not include FSP within the SBCT.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The decision to remove FSP from the SBCT is currently being reviewed by both leaders and subject matter experts at the Army level. There is no doubt that the SBCT can function and operate without FSP for the first twenty-one days of operations. The issue at hand is that the Army field-feeding standard will not be met if the proposed structure remains the same. If the Army is willing to have soldiers eat MREs for extended periods of time, and risk nutritional value added by not having hot meals as well as totally disregard the morale of the troops then there is really no issue. This is certainly not how the Army wants to treat the soldiers serving their nation, and why Army leaders are studying this issue. The Army field-feeding standard as documented in this thesis is a critical CSS multiplier that provides fuel to the warfighter at the right place and time. Four subject areas were analyzed in order to determine if the SBCT required FSP support. The following paragraphs will draw conclusions by summarizing ration nutritional value, food safety and protection standards, field-feeding equipment, and the added flexibility of having organic FSP within the unit.

Rations

When analyzing rations, two questions required answering. The first concerned the ability of forces to subsist on only MREs for twenty-one days or longer. The second concerned the feasibility of having non-FSP prepare A-ration meals. Several studies by USARIEM have shown that MREs do not meet the required nutritional daily balance requirements after consuming them for eight continuous days. Although major

improvements have been made, the MRE still lacks vital nutrients that the body requires during sustained combat operations. In addition, caloric intake fell well below the NSOR. The study conducted by Rose and Carlson stated that significant body weight loss occurred after only eight days of sustained operations when only consuming MREs. The current doctrine calls for the CSSC with field-feeding platoon to be up and operational by D+20 (Motrynzuk 2003). Translated this means that soldiers will consume up to twenty days of MREs; this timeline assumes that deployment timelines are on schedule and that both personnel and equipment arrive on time. The current crop of MREs does not support having them become the sole source for consumption for up to twenty-one days without causing nutrient deficiencies among soldiers. In his research LTC Proietto states three reasons why the Army's operational rations are far from being optimal. The first two reasons concerns the fuel nutrients within the MRE, fats and carbohydrates, both are not in the right quantities and mix in MREs to make them optimal. Third, recent studies indicate conclusively that the quantities of sodium in MREs are simply too high (Proietto 2001, 41). This leads to the second half of this subject area. Can non-FSP prepare A-ration meals?

A subset of this subject area considered the feasibility of having non-FSP prepare A-ration meals necessary to maintain nutritional balance. Food preparation training encompasses eight weeks of specific food service training. If non-FSP were required to attend this training along with their specific combat specialty, they would be required to have an additional skill identifier. Is this requirement realistic? Having to conduct both skills on the battlefield could lead to degradation of skills pertaining to their main career field or their newly adopted skill (food service). Both combat skills and food service

skills require 100 percent concentration and training on a daily basis. The answer to the second question pertaining to preparation of A-rations also indicates that it is not feasible to have a non-MOS trained person prepare meals on the battlefield based on the amount of training requirements, skill sets and expertise required. The training indicated in chapter four would encompass eight weeks of initial training followed by refresher training on a weekly basis so that skills are not lost.

Food Safety and Protection

Safety on the battlefield entails prevention measures that ensure food service operations do not hinder unit readiness. Unit readiness can dramatically change from hour to hour if the proper prevention measures are not followed. The first step is to ensure that qualified and trained personnel are available from start to finish for each operation. The Army cannot risk not having trained personnel overlooking field-feeding operations. There is no evidence that indicates that only FSP can perform this mission, but without their services the potential risk is increased. The dilemma that results by having non-FSP provide this service is that now the Army is asking these soldiers to not only execute their primary wartime mission, but also ensure the safety of over 3,500 SBCT soldiers. Training required to certify non-FSP encompasses an additional twelve hours of yearly training and would compete with their primary military occupation. In order to ensure that skills are not lost, periodic training while in garrison must be conducted. History has shown that DNBI is a leading cause in rendering a unit combat ineffective; lessons learned from past conflicts should not be repeated. The Army must be willing to assume an increase in risk concerning DNBI if the decision is made to have non-FSP perform this mission. This study concludes that having FSP within units helps

to ensure food safety and unit readiness are not hindered based on the services FSP provide on the battlefield.

Equipment

There is no supporting evidence that clearly indicates that non-FSP cannot operate field-feeding equipment provided that training and safety courses are conducted on a continuous basis. Much like any piece of equipment within the Army inventory, a properly trained soldier can master the operations and maintenance of equipment. Again, there is no evidence that rebuts not having an infantry soldier operate an MKT, CK, or KCLFF. The issue with food preparation, as discussed under the rations subject area, is a concern. Another concern relates to the time soldiers will spend away from the primary MOS attending training on equipment operations. Degradation in primary MOS skills again can lead to mission failure. How much time required to train on a weekly basis will be up to the individual command. Priorities must be set and defined so that an individual understands his or her role in combat. Without this input one or the other skill sets will be lost and can ultimately impact operations.

Flexibility and Morale

Interviews with Army leaders indicate that having resources available within the unit adds flexibility with adjusting meal cycles as mission tempo dictates. Having FSP organic to the unit increases flexibility by having them available to prepare a variety of rations when required without diminishing combat power. Flexibility entails having the right resources when and where the mission dictates. Not having FSP as described within subject area one (rations), suggests that only MREs will be consumed during the first twenty days of sustained operations. In addition, based on the conclusion that non-FSP

are not capable of safely preparing A-rations, having qualified personnel only increases flexibility. The cost of having FSP within the SBCT is the footprint is increased from both a personnel and equipment standpoint. FSP are the key link to ensure that soldiers are provided the best field-feeding support possible during operations. FSP in the SBCT provide Commanders the flexibility to employ various feeding options as well as providing them with the responsiveness to react to changes within the operation.

Leaders from various levels have indicated that serving an A-ration meal does have a positive impact on morale. This is one area that can only be measured by feedback from leaders who have seen firsthand the impact and attitudes that soldier's portrayed when provided an A-ration meal. Several leaders, both combat arms and CSS, have indicated that soldiers' morale will be impacted when hot meals are not served.

Recommendation

Currently, new rations are under development that will enhance the soldiers' ability to subsist for prolonged periods of time without degradation of vital nutrients or body weight loss. In the article written by Zanchi and LaBrode, they mention a self-tailoring ration system that is capable of inducing vital nutrients through a skin patch. Until systems and rations similar to this are developed, tested, and fielded FSP should continue to remain within the units to ensure that soldiers forward deployed are receiving the best support possible in accordance with the AFFS. Until this occurs, the decision to remove FSP should be reconsidered. The operating of equipment that FSP provide can be accomplished by any trained soldier provided that concurrent training is being conducted to refine these skills. This study supports having FSP within the SBCT based on three reasons. First, the current makeup of the MRE are not nutritionally sufficient, soldiers'

health and morale are the central issue that must be taken seriously before the Army assumes that twenty-one days or longer of consuming MREs is adequate. In addition, the Army field-feeding standard cannot be met without having the ability to employ various feeding options to include serving hot meals as the mission dictates. These findings make it clear that A-rations are required to ensure our soldiers are nutritionally well balanced to include having a higher state of morale. Second, food safety and protection standards provided by trained FSP helps to ensure that DNBI on the battlefield is minimized. The training and expertise required could only be provided by dedicated individuals who are exposed to food operations on a daily basis. The third reason involves the amount of training required of non-FSP so that food operation skills do not perish. Training on food preparation, food safety and protection, and equipment operations would involve training on a weekly basis. Combat arms soldiers cannot afford to spend time away from their primary military occupation, not only would they be endangering their lives, but those of their fellow soldiers within the unit.

The Army's food program has come a long way, lets not take a step back and assume that MREs are the answer to streamlining the CSS force structure. Until rations meet the required daily balance in nutrient content, fats and carbohydrates then FSP should not be removed or reorganized at a different echelon.

Recommendations for Further Study

A topic for further study concerns the recommended logistics force structure for FSP operating in a SBCT environment. Given that FSP are required based on the lack of technological advancements pertaining to MREs to include adding flexibility to operations, where in the force structure can FSP best serve the Army? FSP are currently

supporting the force under the AOE, FXXI, and SBCT proposed force structures. Each of these structures has pros and cons pertaining to how cooks provide support in a field environment. Recommend comparing the structures against set criteria pertaining to transformation goals and field-feeding doctrine so that a recommended structure is developed.

GLOSSARY

“A” Ration. Fresh ration prepared and served by FSP.

Army Field-Feeding System-Future (AFFS-F). The current field-feeding standard that supports Army operations in a field environment.

Assault Kitchen (AK). Provides heat on the move capability and greater mobility. Can demo in fiscal year (FY) 03. After demonstration, the operational readiness document can be developed, and a limited number produced and fielded in FY05-07 with full-scale production and fielding beginning in FY10.

Battlefield Kitchen (BK). Provides greater capability and incorporates sanitation with fewer cooks. Funding starts in FY10. No ORD yet.

C” Ration. A 12-ounce rectangular canned ration that was introduced in 1939.

Combat Service Support Company (CSSC). A company within the SBCT framework where food service personnel are manned.

Compressed Meals. Still in development; need to field test with war-fighters over time to get true acceptance data. Basically replaces an MRE and adds variety plus capability to have a hot individual meal in vehicles equipped with the mounted water ration heater, and specifically, the FCS if it incorporates water generation. FY05-08.

Container Roll On and Off Platform (CROP). A distribution platform that will enhance the use of preconfigured loads in containers by reducing the requirement to break down rations into unit piles.

Containerized Kitchen (CK). New field-feeding kitchen that was fielded in 2001.

D-ration. Canned rations introduced in 1941. The ingredients were chocolate, sugar, dry milk, cacao fat, oat flower, and flavoring--a mixture providing 600 calories per bar.

K-ration. A pocket ration for paratroopers developed at the request of the Air Force early in the war in 1942.

Kitchen Company Level Field-Feeding (KCLFF). With HMMWV and high mobility trailer (HMT), provides the feeding capability forward within the battlefield. The limitation with the KCLFF is that it is only capable of preparing UGR H&S meals.

Mobile Kitchen Trailer (MKT). The current field-feeding kitchen which has been in existence since 1972.

Multi-Temperature Refrigerated Container System (MTRCS). An 8 by 8 by 20-foot container for use with the Army's HEMTT- Load Handling System (LHS) has a dual-climate capability with adjustable compartments that will allow the Army to store fresh, chilled, and frozen rations, thus reducing the requirement for the amount of resources needed.

Meals Ready to Eat (MRE). Operational rations packaged in boxes of twelve to include two vegetarian meals in each module. Included in each MRE are heating elements.

Remote Unit Self-Heating Meal (RUSH-M). This is not a cook replacement but allows a hot group meal for small-sized units when cooks are not available. (No data available yet as to commander or soldier acceptance.) Heating technology needs work; still a few years off--FY 2005-2008.

Tray Rations (T-rations). Operational heat and serve rations that have been replaced by the UGR-H&S in FY2000.

Unitized Group Rations-A. replaced line-by-line ration items in FY 2000; configured in three box modules that support fifty personnel.

Unitized Group Ration-Heat and Serve (UGR-H&S). Replaced the T-Ration in FY2000.

The 5 in 1 Ration. Intended to provide a specialized ration for motorized combat groups operating in desert areas. The goal of this development was a ration that would be convenient to issue and could be prepared by small groups of men with a minimum of cooking equipment and skill. Another objective was to furnish sufficient food to take care of five men for one day.

The 10 in 1 Ration. The 10-in-1 was essentially two 5-in-1s packed in one unit.

92G. Military Occupation Specialty for FSP.

REFERENCE LIST

- Anders, Steven E. 2002. The Best Feeding the Best. *Quartermaster Professional Bulletin*, (summer 2002), 10-15.
- AR 30-22. 2002. See Department of the Army.
- AR 40-25. 2001. See Department of the Army.
- Beach, John C., CPT. 2000. Food Safety Diagnostics: Ensuring Safe Food for Soldiers. *Army Logistician*, May-June 2000, 1-6.
- Dean, Charlie, LTC, SFC Sam Newland. USARIEM, Lessons Learned in Afghanistan. Natick Soldier Center, Natick, MA. April 2002.
- Department of the Army. 2001. AR 40-25, *Army Nutrient Standards*. Washington, DC: Government Printing Office.
- _____. 2002. AR 30-22, *The Army Food Program*. Washington, DC: Government Printing Office.
- _____. 2002. DA PAM 30-22. *Operating Procedures for the Army Food Program*. Washington, DC: Government Printing Office
- _____. 2001. FM 1, *The Army*. St. Louis, MO: US. Army Publications Distribution Center.
- _____. 2002. FM 4-93.7, *Combat Service Support to the Interim Brigade Combat Team (IBCT)*. Washington, DC: Government Printing Office. Final Coordinating Draft.
- _____. 1996. FM 10-23, *Basic Doctrine for Army Field-feeding and Class I Operations Management*. Washington, DC: Government Printing Office.
- _____. 2002. TB 530. *Occupational and Environmental Health Food Sanitation*. Washington, DC: Government Printing Office
- Ferrel, Marva CW2, 296th BSB/SBCT Food Service Advisor. Electronic interview by author, 25 February 2003.
- FM 1. 2001. See Department of the Army. 2001.
- FM 10-23. 1996. See Department of the Army. 1996.
- FM 4-93.7. 2002. See Department of the Army 2002.

- French, Daniel COL (Ret.). CGSC Civilian Contractor and former Brigade Commander interviewed by author, 31 Mar 2003, Fort Leavenworth. Tape recording in author's possession.
- Griffin, Reginald, CW3, Army Center of Excellence-Subsistence Instructor. Electronic interview by author, Fort Leavenworth, KS, 27 February 2003.
- Gruenwald, Michael, LTC, Combined Arms Training Course Instructor. Interview by author, 19 February 2003, Fort Leavenworth. Tape recording in author's possession.
- Guererro, Zulma. 1999. Combat Service Support Company: Support to the IBCT in Extended Operations. CASCOM briefing, Fort Lee, VA. Powerpoint Slides.
- Hirsch, E., H.L. Meiselman, R.D. Popper, G. Smits, B. Jezior, I. Lichten, N. Wenkam, J. Buxtt, M. N. Thiele and O. Dirige. The Effects of Prolonged feeding meal, ready-to-eat (MRE) operational rations. NATICK Technical Report TR-85/035, 1984.
- Kratzer, David, MG. 2002. Quote from a briefing titled, Objective Force Field-Feeding and Logistics Transformation Task Force Issue Brief. CASCOM briefing, Fort Lee, VA.
- Majewski, Albin R. 2002. Field-feeding in the Interim Force and Objective Force. *Quartermaster Professional Bulletin*, (summer 2002): 46-49.
- MMWR Weekly Magazine. 1999. Norwalk-Like Viral Gastroenteritis in US Army Trainees—Texas, 1998. Internet address, <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00056753.htm>.
- National Restaurant Association. 1995. Applied Food Service Sanitation Certification Coursebook, 4th Edition. Chicago: The Education Foundation of the National Restaurant Assosiation.
- Proietto, Richard LTC. 2001. Applying Scientific Research to Optimize Operational Rations- Exploring the Possibilities. Ph.D. Monograph, School of Advanced Military Studies, US. Army Command and General Staff College, Fort Leavenworth, KS.
- Rhem, Kathleen Staff Sgt. 2000. Food-Borne Illness. American Forces Press Service. Internet address, <http://www.hq.nasa.gov/office/codeq/safety/fbi.htm>
- Roberts, D. E., E. W. Askew, M. S. Rose, M. A. Sharp, M.A., S. Bruttig, J. C. Buchbinder, 1987. *Nutritional and Hydration Status of Special Forces Soldiers Consuming the Ration Cold Weather, or the Meal, Ready-To-Eat-Ration During a Ten Day Cold Weather Field Training Exercise*. Fort Detrick, MD: US. Army Research Institute of Environmental Medicine. USARIEM, T8-87.

- Rose, Madeleine S., and Dawn E. Carlson. 1986. *Effects of A-ration Meals on Body Weight During Sustained Field Operations*. Fort Detrick, MD: US. Army Research Institute of Environmental Medicine. USARIEM, T2-87.
- Sherman, Doris E. 2002. *Nutrient Content of the Meal, Ready -to-Eat 1988-1999*. Natick, MA: US. Army Research Institute of Environmental Medicine. USARIEM, TN-02/3.
- Shinseki, Eric. 1999. Objective Force White Paper. Department of the Army.
- Soby, Charles COL (Ret.). CGSC Civilian Contractor and former Brigade Commander interviewed by author, 12 February 2003, Fort Leavenworth. Tape recording in author's possession.
- TB MED 530. 2002. See Department of the Army. 2002.
- US Army Logistics Management College. 2003. Theater Logistics Handbook. Fort Lee, Virginia, CASCOM, 6th Edition, January 2003.
- Zanchi, Joseph A., and Alan J. LaBrode. 1999. Combat Ration Logistics: From Here to Eternity. *Army Logistician*, January-February 1999.

INITIAL DISTRIBUTION LIST

1. Combined Arms Research Library
US Army Command and General Staff College
2550 Gibbon Ave.
Fort Leavenworth, KS 66027-2314
2. Defense Technical Information Center/OCA
825 John J. Kingman Rd., Suite 944
Fort Belvoir, VA 22060-6218
3. LTC Tracy L. Wickham
DLRO
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352
4. LTC Michael A. Wooten
DLRO
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352
5. LTC Harold A. Bochsler
DLRO
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352
6. COL Marshall J. Goby
502 Eagle Court
Riverwoods, IL 60015-3866

STATEMENT A: Approved for public release; distribution is unlimited. (Documents with this statement may be made available or sold to the general public and foreign nationals).

STATEMENT B: Distribution authorized to U.S. Government agencies only (insert reason and date ON REVERSE OF THIS FORM). Currently used reasons for imposing this statement include the following:

1. Foreign Government Information. Protection of foreign information.
2. Proprietary Information. Protection of proprietary information not owned by the U.S. Government.
3. Critical Technology. Protection and control of critical technology including technical data with potential military application.
4. Test and Evaluation. Protection of test and evaluation of commercial production or military hardware.
5. Contractor Performance Evaluation. Protection of information involving contractor performance evaluation.
6. Premature Dissemination. Protection of information involving systems or hardware from premature dissemination.
7. Administrative/Operational Use. Protection of information restricted to official use or for administrative or operational purposes.
8. Software Documentation. Protection of software documentation - release only in accordance with the provisions of DoD Instruction 7930.2.
9. Specific Authority. Protection of information required by a specific authority.
10. Direct Military Support. To protect export-controlled technical data of such military significance that release for purposes other than direct support of DoD-approved activities may jeopardize a U.S. military advantage.

STATEMENT C: Distribution authorized to U.S. Government agencies and their contractors: (REASON AND DATE). Currently most used reasons are 1, 3, 7, 8, and 9 above.

STATEMENT D: Distribution authorized to DoD and U.S. DoD contractors only; (REASON AND DATE). Currently most reasons are 1, 3, 7, 8, and 9 above.

STATEMENT E: Distribution authorized to DoD only; (REASON AND DATE). Currently most used reasons are 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

STATEMENT F: Further dissemination only as directed by (controlling DoD office and date), or higher DoD authority. Used when the DoD originator determines that information is subject to special dissemination limitation specified by paragraph 4-505, DoD 5200.1-R.

STATEMENT X: Distribution authorized to U.S. Government agencies and private individuals of enterprises eligible to obtain export-controlled technical data in accordance with DoD Directive 5230.25; (date). Controlling DoD office is (insert).