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MILITARY FOOD INSPECTION: ITS HISTORY AND ITS EFFECT ON READINESS
AN INDIVIDUAL STUDY PROJECT

by

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TABLE OF CONTENTS

	Page
ABSTRACT.....	ii
CHAPTER I. INTRODUCTION.....	1
II. FOOD INSPECTION PRIOR TO 1916.....	9
III. FOOD INSPECTION, 1916-1941.....	19
IV. FOOD INSPECTION DURING WW II (1941-45).....	26
V. FOOD INSPECTION, 1946-1973.....	32
VI. FOOD INSPECTION DURING VIETNAM (1962-73)....	39
VII. FOOD INSPECTION, 1970-PRESENT.....	47
VIII. FOOD INSPECTION: ITS EFFECT ON READINESS....	61
BIBLIOGRAPHY	69

CHAPTER ONE
INTRODUCTION

Early medical leaders recognized the importance of wholesome food and drink long before man's knowledge of bacteria and the germ theory of disease came into existence. The clinician Rhazes in 860-932 A.D. stated in his precepts on military hygiene that food and drink were causes of many diseases and that they should be inspected with great caution.¹ Rhazes' precepts were stated long before the germ theory of disease was developed. Even so the life of early man was governed by superstition. Thus it is not surprising that disease, often followed by death, was attributed to the wrath of divine spirits for the punishment of individual sins. The real basis for the foundation of the germ theory of disease was developed by Jacob Henle in 1840. In 1849 John Snow observed epidemic cholera to be water-borne. This observation supported the germ theory. Louis Pasteur provided additional proof in 1870 by his discovery that a disease of the silkworm was caused by a protozoan parasite. Then the absolute proof came as the result of the work of Robert Koch on Anthrax in 1876. So it was due largely to the efforts of Koch and Pasteur that the germ theory of disease became a fact.² Prior to the germ theory, clinicians were unsure about the cause of disease.

Medical history reveals that before the 20th Century more troops were lost to disease than to bullets.³ This often contributed to the loss of battles and even wars. For example, in the Crimean War (1854-56), the French lost 96,615 men. But only 10,240 fell before the enemy, while 75,000 died of disease. Then in the American Civil War 281,000 men died. Ninety-seven thousand died in battle, and 184,000 from sicknesses.⁴ Many of the fatal diseases in these wars were spread by food and drink.

Despite this evidence, disease has received comparatively meager attention throughout the years as a significant element in military operational planning. This inadequacy of planning for the medical aspects of a campaign reflects a legitimate appreciation of the limitations of the sources. Throughout many campaigns medical and operational considerations are usually interdependent.⁵ Only in WWII did battle deaths exceed those from other causes for the first time. This was in large part due because of medical care which included improved food inspection procedures and techniques. Keeping soldiers healthy is essential for combat readiness. Diarrheal diseases have been known to immobilize troops. During the North Africa campaign in WWII, 30 percent of the German forces under Rommel were felled by diarrhea. Lack of sanitation caused this medical disaster.⁶ In Vietnam, as many as 73 percent of hospital admissions were caused by disease.⁷ So illness remains a major problem for the military. Two months after Operation Desert Shield began (August 1990), soldiers were finding that the major challenges had less

to do with war than with living standards, which were determined mostly by the availability and quality of their water, food, sanitation, and shelter. The chief risks--in the absence of fighting--were dehydration, diarrhea, and other intestinal ailments.⁹ Therefore, even today illness remains a major concern for commanders and military medical personnel.

There are many causes of nonbattle disease and death. The story of Mary Malone, commonly known as "Typhoid Mary" is one of the classical illustrations of the damage which may result from an immune carrier. "Typhoid Mary" was a carrier of Salmonella. She contaminated the food she handled, thus transmitting the disease to many other individuals. Chronic carriers such as "Mary" should not be allowed as food handlers. Thus, we now require tests and examinations for food handling personnel.⁹ The causes of diarrheal illness can be many: food or water tainted with bacteria or viruses, mishandling of food and water and so forth. To minimize foodborne disease in Operation Desert Shield, military food inspectors frequently check military supplies as well as local food sources. Military veterinarians routinely examine livestock and slaughter houses to ensure that meat is disease-free and is being stored and handled in a sanitary manner. The contributions of the military veterinarians deployed to the Middle East extend beyond the traditionally recognized need for veterinary medical care to military working dogs.¹⁰ A high priority of the Army's veterinary services is to ensure that sources of food provided through host nation-sponsored feeding

programs meet established public health standards. Veterinary service personnel are providing technical advice and guidance regarding the procurement, transportation, storage, and distribution of food items being fed to U. S. troops participating in Operation Desert Shield.¹¹ In fact, among the first five logisticians deployed were three contracting personnel to coordinate host-nation support in all areas--including fresh food supply, especially fresh bread.¹² If the logistics community determine the need for local procurement of food, then it is essential that the Army Veterinary Service oversee this acquisition process to ensure that our personnel are fed wholesome food.

The role of the veterinary service has certainly changed throughout the years. Food inspection has become the major part of the mission of the Army Veterinary Service. In the last century, there has been a constant struggle between the suppliers of food (civilians and Quarter Master Corps (QMC)) and the inspection service. The food suppliers seek to deliver sufficient quantities as quickly as possible. But the inspectors know too well that no food is better than contaminated food. So they seek to guarantee that all food served to our troops is safe. Thus we have the traditional conflict between quantity and quality.

Veterinary inspections applicable to meat and dairy products may be classified into three groups:

- (1) Antemortem and postmortem inspections (classes 1 and 2).

(2) Procurement inspections made to determine grades, measurements, and sanitary conditions (classes 3 and 4).

(3) Surveillance inspections provide continuous monitoring of food supplies from procurement to issue to troop dining facilities (classes 5, 6, 7, and 9).¹³

Further, Class 8 inspection oversee food purchases made by the exchange services. Such purchases will not be discussed in this paper, since the food products are not a part of the Army supply system.¹⁴

A categorical description of these inspections follows:

1) Class 1 or antemortem inspection: the physical examination of live animals before slaughter to detect disease or noxious conditions that would make them unfit for human consumption.

2) Class 2 or postmortem inspection: the examination of carcasses and viscera of animals immediately after slaughter to determine if they are free of disease or conditions that would make them unfit for human consumption.

3) Class 3 or prior to purchase (origin) inspection: Tests to ensure food products comply with requirements for wholesomeness, quality, and net weight.

4) Class 4 or on delivery at purchase (destination) inspection: examination of food when it is delivered to the government. Products are tested to ensure that they comply with the requirements of sanitation, wholesomeness, and quality as specified in the contract or other purchase document.

5) Class 5 or any receipt except purchase inspection: examination conducted to detect any damage or deterioration that occurred during transportation. A sanitary inspection of the vehicle in which the food is transported is also performed.

6) Class 6 or prior-to-issue or prior-to-shipment inspection: examination determines if foods are sound and suitable for shipment and for the purposes intended. Inspections ensure that labor, transportation, and foods are not wasted by shipping products that may be damaged, deteriorated, or otherwise devalued on arrival at destination.

7) Class 7 or at-issue or at-sale inspection: examinations made at the time of issue to troop dining facilities, other government dining facilities, and after receipt but before sale of food in commissary stores.

8) Class 9 or during storage inspections: examinations are made of government-owned foods held in storage or reserve for an appreciable length of time.¹⁵

Thus this classification of inspection procedures refers to the inspection of products from the food source, through the delivery process, and up to the time the food is served in the dining facility. But inspections involve more than their systematic examination of food products. A veterinary sanitary inspection of establishments is conducted simultaneously with the product inspections. Establishments include commercial food plants such as animal slaughter houses, milk plants, bakeries, ice cream plants, and warehouses. Before an establishment

receives an army procurement contract, it must pass an army veterinary sanitary inspection. The only exceptions are for establishments operating under the supervision of approved civilian inspection agencies, such as USDA.⁶ The following chapters will trace the history and convey the importance of military food inspection throughout the years.

ENDNOTES

1. F. H. Garrison, Notes on the History of Military Medicine, 1922.
2. I. A. Merchant and R. A. Packer, Veterinary Bacteriology and Virology, 1967, pp. 5-12.
3. John Sloan Brown, "Of Battle and Disease: The East Africa Campaign of 1914-18," Parameters, June 1982, p. 16.
4. U. S. Department of the Army, Report of the Surgeon General to the Secretary of War, 1918.
5. Brown, p. 16.
6. Sally Squires, "Harsh Conditions Pose Hazard to GIS in Persian Gulf," Washington Post, 9 October 1990, p. 14.
7. Ibid.
8. Ibid.
9. Merchant and Packer, p. 293.
10. Paul Zuziak, "Military Veterinarians Key Public Health Role in Operation Desert Shield," Journal of American Veterinary Medical Association, 15 November , p. 1265.
11. Ibid., p. 1267.
12. General Glenn K. Otis, General Frederick J. Kroesen, and General Louis C. Wagner, Jr., "Our Deployment into the Persian Gulf--Three Views," Army, November 1990, p. 18.
13. Everett B. Miller, United States Army Veterinary Service in World War II, p. 677.
14. Ibid.
15. U. S. Departments of the Army and the Navy, Army regulation 40-657, Navy Supply Instruction 4355.4F, Marine Corps Order PL0110.31G, pp. 11-13.
16. Miller, p. 679.

CHAPTER TWO

FOOD INSPECTION PRIOR TO 1916

George Washington was perhaps the first great military commander in the U. S. to understand the importance of food hygiene. His writings are significant in understanding the problems of military food hygiene. In 1755 he describes the procuring of salt beef, some of which had to be condemned upon receipt. Because of storage and transportation problems of processed meat, it was better to drive live cattle behind the armies for slaughter as needed. In Washington's communications with his supply man, he directed him to send the doctor to see that the cattle were properly killed and salted.¹ While it must be assumed that supervision of slaughter and processing by a medical officer was an exception rather than the rule, it is evident that Washington insisted upon the best food hygiene at his command.²

One of Washington's first general orders as Commander-in - Chief of the colonial forces in the Revolutionary War (1775) reads: "Next to cleanliness, nothing is more conducive to a soldiers' health than dressing his provisions in a decent and proper manner. The officers commanding companies should therefore daily inspect the camp kitchen, and see the men dress

their food in a wholesome way."³ It was not until 1783, the last year of the war, however, that official provisions for civilian inspection of meat destined for the army were made. In a general order Washington directed that the contractors for the army to appoint a person to inspect the cattle destined for the army.⁴

During the War of 1812, a food inspector with the most famous nickname in history was Samuel Wilson of Troy, New York. He was known by his friends and neighbors as "Uncle Sam". Wilson supplied meat to the soldiers at a nearby post as a subcontractor and also worked as a meat inspector for the state. Because "U.S." was stamped on each package for the Army the meat was referred to a "Uncle Sam's Beef". The term spread to anything that belonged to the federal government.⁵

During the Civil War, diarrhea and dysenteries had a greater incidence and mortality than any other form of disease. One death in every four caused by disease was due to diarrheas and dysenteries.⁶ What portion of these diseases were caused by food that was unwholesome at the time of receipt, or due to mishandling at a later date cannot be determined.

In addition to wholesomeness, the quality of the food supplied to the army often provided problems. The difference between wholesome and quality can be described by defining each term. Wholesome is a term that means healthful and free from risk, i.e., freedom from pathogenic (disease producing) organisms. Quality is a term that relates to the level of excellence and is not normally related to the healthfulness of

the item, i.e., net weight, percent fat, and percent protein. Officers of the Quartermaster Corps testified that the bread issued was often stale; the flour moldy and full of bugs; the pork rusty; and the beef not fit to be issued.' There were no veterinarians in the Army prior to the Civil War. This is not surprising since there were few in the civilian community, and the Army would have had them only to care for the horses and mules of the mounted troops.⁸

It was in the 1870s that the Army initiated the veterinary services. A civilian veterinarian named Treacy worked for the army starting in the 1870s. He suggested that veterinarians should be responsible for inspecting the army's food supply. Meat was received on frontier army posts and inspected by young officers who did not even assume to know anything about food. Dairy products were obtained from cows kept in insanitary sheds and eating the refuse from the horse stables.⁹ Treacy's ideas were never implemented, thus insanitary conditions continued to cause problems.

Why didn't the military veterinarian assist in eliminating the problem? The military veterinarian had no assigned duty or responsibility for army subsistence during the Spanish-American War.¹⁰ His duties consisted of providing medical care to the horses of the cavalry.

Insanitary conditions, poor handling of foods, and the absence of veterinary food inspection personnel, led to a very important event in the development of the Veterinary Corps. One

of the most sensational aspects of the Spanish-American War as well as a historical milestone to military food inspection was the charge that soldiers in the army camps of the South, and in Cuba and Puerto Rico had been fed beef preserved with harmful chemicals. The press of the day called this "embalmed beef", and the charge was that such beef was responsible for much of the sickness and death in the War.¹¹ The chief military officer, Major General Nelson Miles, made sensational charges against two items in the army ration: canned roast beef and refrigerated carcass beef. The allegations were stated in public interviews in which General Miles stated his belief that the food was the cause for considerable sickness and distress in the wartime army. There was some truth in the allegations, but the major problem was that the canned roast beef suffered from army mishandling in its distribution. The mishandling was such that when the meat was eaten, it was definitely unpalatable i.e, soft and mushy. The system of procurement which depended on contractor's own quality inspectors, together with many untrained Subsistence Department personnel, contributed to the doubts about food quality and sanitation.¹²

As a result of the veterinarian not being used for food inspection duties, the same wagons used to transport horse manure and garbage were also used to pick up the regimental supply of vegetables and frozen beef from the railheads. News media accounts of maggots in the food were often true, but the maggots

originated from the delivery system rather than the food supply.¹³

As a result of the publicity, the War Investigation Commission or the Dodge Commission was named to inquire into various allegations of mismanagement. As the Dodge commission was concluding its hearings, General Miles renewed his charges again to the news media. Another investigation was established. This one, the Military Court of Inquiry, or the Beef Court, was formed to investigate certain allegations in respect to the unfitness for issue certain articles of food furnished by the Subsistence Department to troops in the field.¹⁴

The conclusions reported by the Dodge Commission in February 1899 and the Beef Court in April 1899 were as follows: "that no refrigerated beef furnished by the contractors and issued to the troops during the war with Spain, was subjected to or treated with any chemicals by anyone. In addition, the refrigerated beef furnished under contracts for use of the armies, was not doctored or treated with any other agent other than cold air." Those opinions were not universally shared by the public due to the prejudiced news media.¹⁵

The lack of military food inspection in the 19th century was certainly a contributing factor to the fact that disease was a grater cause of death in battle than bullets. In the latter part of the century, military medicine made great advances, accurate medical records first appeared, and medical problems received attention in military studies.¹⁶

The status of military food inspection was unchanged in the hasty, confused conduct of the war. Medical authorities now understood some of the differences between the diseases caused by bacteria versus the diseases caused by chemicals. However, the subsistence supply system still ignored every inspection safeguard (even in the presence of veterinarians) that might have reduced losses due to poor procurement procedures and careless handling of food products. This readily led to the "embalmed beef" scandal. The scandal produced drastic reactions abroad with the meat export trade to Europe. The scandal and resulting actions increased progress toward military food inspection and the nation's first complete federal meat inspection law (1906).¹⁷

From the scandal the army learned the following: (1) that good chilled and canned meat can be spoiled by improper handling in the field; (2) that soldiers should be taught how to use their rations; (3) that soldiers should not be fed the same canned meat day after day (due to boredom); (4) that it was practical to send chilled beef from a packing house via refrigerated ship to a refrigerated warehouse from which it could be distributed to troops in the rear areas or camps; and (5) that military veterinarians/food inspection personnel were needed to provide sanitary services to the soldiers.¹⁸

The end of the investigation of the embalmed beef marked the start of the Army's Veterinary Food Inspection Service. In July 1901, a veterinarian was transferred from the U. S. Department of Agriculture (USDA) and appointed Meat Inspector, Subsistence

Department at Large, U. S. Army. His function was to make receipt inspection of meats in addition to inspections made prior to delivery by veterinary inspectors of the USDA. By 1906 the number of inspectors working for the Army had been increased to six. In addition, War Department orders had directed post commanders to use veterinarians to conduct antemortem and postmortem inspections of beef purchased locally.¹⁹

In 1905 another significant event occurred that would contribute immensely to the development of a Army Veterinary Corps/military food inspection service. Upton Sinclair wrote a book called The Jungle. Sinclair believed that the Socialist party was the way to end poverty throughout the world. For seven weeks Sinclair lived in the Chicago packinghouse district. Then he wrote his book. Sinclair wrote of using meat collected from drain traps and the after-hours slaughter of sick/diseased cows and hogs dead from cholera. He wrote of making sausage from spoiled meat dosed with borax and glycerine and sometimes including rats that had died in the great piles of spoiled meat in the cellars.²⁰

The Jungle became a best seller. As a result, President Roosevelt ordered an investigation and the packing industry started to clean up.²¹ It was the old and crippled and diseased cattle that was canned and thus became the embalmed beef that had (alleged) killed several times as many soldiers as all the bullets of the Spaniards.²² Public opinion contributed to eventual reforms.

The six veterinarians continued to inspect meats procured by the Subsistence Department from 1905 to 1912. On 24 August 1912 Congress passed legislation that created the Quartermaster Corps (QMC) from the former Subsistence, Pay, and Quartermaster Departments. Thus from 1912 to 1916 these civilian veterinarians worked for the QMC.²³

The final result of the Presidential investigation and Sinclair's book was that inadequacies of the federal meat inspection service of the USDA and the lack of a meat inspection service in the army were highlighted and brought to the attention of the Federal Government. These were significant factors that eventually resulted in the Federal Food and Drug Act and the Meat Inspection Act, both in 1906, as well as authorization for the establishment of the Army Veterinary Corps on 3 June 1916 by the National Defense Act.²⁴

ENDNOTES

1. J. F. Smithcors, The Veterinarian in America, 1625-1975, p. 141.
2. Ibid., p. 142.
3. Ibid., p. 143.
4. Ibid.
5. "Meat for the Multitudes," The National Provisioner, 4 July 1981, p. 44.
6. Erna Risch, Quartermaster Support of the Army-A History of the Corps, 1775-1939, p. 535.
7. Ibid.
8. L. A. Merillat and D. M. Campbell, Veterinary Military History of the United States, p. 123.
9. Ibid., p. 233.
10. Everett B. Miller, "Veterinary Medical Service of the Army in the Spanish-American War, 1898 (with notes on the "embalmed beef" scandal)," Veterinary Heritage, February 1988, p. 26.
11. Ibid., p. 28.
12. Ibid., p. 29.
13. Edward F. Keuchel, "Chemicals and Meat, The Embalmed Beef Scandal of the Spanish-American War," Bulletin of the History of Medicine, 1974, p. 255.
14. Ibid.
15. Ibid., p. 30.
16. John Sloan Brown, "Of Battle and Disease: The East African Campaign of 1914-18," Parameters, June 1982, p. 16.
17. Keuchel, p. 31.
18. "Meat For the Multitudes," p. 80.

19. Smithcors, p. 151.
20. Upton Sinclair, The Jungle, p. 67 and pp. 135-136.
21. Merillat and Campbell, p. 229.
22. Sinclair, p. 99.
23. Everett B. Miller, United States Army Veterinary Service in World War II, 1986, p. 3.
24. Ibid.

CHAPTER THREE

FOOD INSPECTION, 1916-1941

As a result of the National Defense Act, the Army Veterinary Corps was established with commissioned officers. At the same time the Corps became a component of the Army Medical Department. With the beginning of WWI, it was evident that the demand for veterinary officers would be met by the appointment of veterinarians in the Veterinary Section, Officers' Reserve Corps.¹ The beginning of the U. S. entry into the war found the meat inspection force of the Army limited to three regular Army veterinary officers, three civilian veterinarians and one retired enlisted man.² Military food inspection was still lacking as evidenced by the absence of veterinary enlisted personnel that had not been provided for by the National Defense Act of 1916. Enlisted personnel were needed to extend the level of food inspection to all levels of the Army since there were insufficient officers (veterinarians) available to provide services to every unit.

A recommendation submitted to the Surgeon General of the Army by the American Veterinary Medical Association resulted in the publication of General Orders No. 130, 4 October 1917, which established a National Army Veterinary Corps consisting of commissioned and enlisted personnel.³

The force from April 1917 to November 1918 increased to 78 officers and 109 enlisted men located in 102 meat-producing establishments in 31 cities.⁴

Due to the onset of WWI, the newly created Army Veterinary Service was expanded even before its fundamental principles or nuclei were fully developed.⁵ At the onset, George A. Lytle was assigned in Chicago as a subsistence inspector for the U. S. Army. Dr. Lytle has been referred to as the "Father of Army Veterinary Food Inspection". It was as a result of his efforts that he obtained authority from the Surgeon General to establish a school for meat inspectors in Chicago in June 1917. He supervised and trained a meat and dairy products inspection service. As the inspection force was trained, either on the job, or in school, they were rapidly deployed to meet the accelerating procurement of meats and dairy products required for the Army.

Several key events/programs took place during WWI that set the stage for the work of the Army Veterinary Service of today. A key individual was Dr. Lytle. He established the basic principles of an effective military food inspection system that are still valid and that are being used today. He developed the nine classes of inspection as outlined in the joint regulation, Veterinary/Medical Food Inspection and Laboratory Services, AR 40-657/NAVSUPINST 4355.4/MCO P10110.31.⁶ These nine classes of inspection were discussed in the introduction to this study project.

The amount of food inspected by the inspection service was

unbelievable. From April 1917 to March 1919, the inspection force inspected at purchasing points 1.26 billion pounds of meat and dairy products having a monetary value of over 474 million dollars. An additional 234 million pounds inspected at camps, or 31 million pounds of meat inspected, packed, and shipped for civilian relief work in Europe, or almost a million pounds of fresh frozen beef inspected for the Italian Government was not included in the total of 1.26 billion pounds. In all, approximately 11 million pounds were condemned and thus, was prevented from becoming a part of the military food supply system.⁷

This work was accomplished without a whisper of scandal and from no source was any criticism of the program heard. The effectiveness of this service was greatly appreciated by officials of the War Department; many of whom vividly remembered the highly publicized meat scandals of the Spanish-American War and had considered some repetition inevitable.⁸

The importance of food inspection could be shown by comparing the value of the products with other work of the Veterinary Service. An estimated 20 percent of the veterinary personnel in WWI were utilized as food inspectors.⁹ The Army horses (306,000) had an approximate value of \$200 each, which would have a total value of 60,200,00 dollars. The total value of meat and dairy products inspected at central purchasing points was 474 million dollars--almost seven times the value of the horses. Inspection is also important because of its intimate

relation to the health of the troops. The health of the horses was essential largely from a financial standpoint. The health of the troops and their combat efficiency was far more significant.¹⁰

At camps the meat inspectors supervised the supply of meat and milk, inspected it upon receipt, supervised the storing, handling, and issuing, and saw that the wagons were clean and the meat was handled in a sanitary manner to ensure its delivery to the kitchen in good condition.¹¹

The school of Meat and Dairy inspection that was established in Chicago in 1917 was ultimately moved to Washington, D.C. as the Veterinary School of the Army Medical Center. It was later moved back to Chicago as the Meat and Dairy Hygiene School.¹² The school would eventually move to The Academy of Health Sciences, Fort Sam Houston, Texas in 1973. The school graduated 162 officers and 196 enlisted men between 1920 and 1941.¹³

From 1919 until 1935, food inspection was confined to the requirements of a small peacetime army. It was a time of training and standardization of policies and procedures. This was a period in which extensive progress was made in protecting the health of the soldier and his family from unwholesome milk and dairy products. By the use of education and verbal suggestions, the cooperation of civilian operators of dairies was secured in cleaning up insanitary conditions and maintaining tuberculin-tested herds. Thus, by excluding insanitary plants as sources of Army supply, the health of the soldier was protected.

In addition, the dairy industry improved which also was beneficial to the civilian consumer.¹⁴ The administrative, technical, and professional responsibilities involving the veterinary service were officially prescribed in Army regulations for the first in 1922.¹⁵

In 1933 an event occurred that was to play an important part in the readiness posture of the Veterinary Corps during the later wartime years. Under Executive orders issued by the President under the Act of Congress entitled "an act for the relief of unemployment through performance of useful public works, and for other purposes", the Civilian Conservation Corps (CCC) was approved and ultimately was placed under the War Department supervision. The CCC was to reach a force of 2.5 million.¹⁶ At the time the CCC was activated, USDA had the responsibility for inspecting food for the CCC. The Army Veterinary Service performed inspections of perishable foods only at military posts and depots. The USDA was not up to the challenge, and therefore, as a result, the entire inspection service was placed under the Veterinary Service; thereby relieving USDA from the emergency work.¹⁷ The veterinary workload due to the CCC resulted in practically doubling the size of the active duty Veterinary Corps. The Veterinary Service was so successful in the field of sanitation (food inspection) and quality grading of foods of animal origin that the CCC commanders requested the inspection of other foods such as fresh and canned fruits and vegetables, and

bread. This appears to be the first major effort in the inspection of foods other than those of animal origin.¹⁸

It was the experience that the Veterinary Service obtained during the CCC years, inspecting both animal and non-animal (vegetables and bread) items that provided an experienced nucleus of trained officers that was to become invaluable in the early days of WWII.¹⁹

ENDNOTES

1. J. F. Smithcors, The Veterinarian in America, 1625-1975, 1975, p. 153.
2. George A. Lytle, "The United States Army Meat Supply", Journal of the American Veterinary Medical Association, 1920, p. 167.
3. Smithcors, p. 154.
4. Lytle, p. 171.
5. C.F. Morse, "History of the U. S. Army Veterinary Corps in World War I," unpublished, p 80.
6. Smithcors, p. 155.
7. L.A. Merilliat and D. M. Campbell, Veterinary Military History, 1935, p. 592.
8. Ibid., p. 593.
9. Everett B. Miller, United States Army Veterinary Service in World War II, 1986, p. 675.
10. Lytle, p. 155.
11. Ibid., p. 171.
12. Morse, p. 80.
13. Miller, p. 14.
14. U. S. Department of The Army, Report of the Surgeon General to the Secretary of War, 1922, p. 143.
15. Ibid., p. 142.
16. Miller, p. 11.
17. U. S. Department of the Army, Report of the Surgeon General to the Secretary of War, 1935.
18. U. S. Department of the Army, Report of the Surgeon General to the Secretary of War, 1937.
19. Miller, p. 12.

CHAPTER FOUR

FOOD INSPECTION DURING WWII (1941-45)

The onset of WWII found the Army Veterinary Service with a tested definition of its mission and responsibilities. The expansion of the Army Veterinary Service was orderly, even showing increasing efficiency in responding to problems which arose.¹ The veterinary service expanded from its regular strength of approximately 126 officers in 1939 to 2116 in August 1945. The enlisted strength ranged between six to eight thousand. While in WWI, an estimated 20 percent of the veterinary personnel were utilized as food inspectors (remaining personnel were involved in the animal mission); in WWII 90-95 percent were used in the food inspection mission. From 1940-45, the veterinary service conducted a meat and dairy products inspection program that inspected more than 142 billion pounds.²

The mission and responsibilities of the veterinary service in WWII were generally no different than those defined soon after the establishment of the Veterinary Corps. However, the emphasis shifted from one of animal medicine to that of food inspection. With reference to food supplies, the Army Veterinary Service:

- 1) Applied the principles of sanitary control over the production, shipment, storage, issue, and other handling of food products including milk herds and dairies.

2) Reduced/eliminated hazards to troop health that existed in diseased, contaminated, or deteriorated food supplies, by sanitary inspections, and reinspections of food products.

3) Assured that the quality and quantity of foods were delivered sanitarily by contractors in accordance with specifications and/or purchase instruments.³

The following table indicates the magnitude of the mission and responsibilities of the Veterinary Service during WWII:⁴

YEAR	GRAND TOTAL	PROCUREMENT		SURVEILLANCE	
		PASSED	REJECTED	PASSED	REJECTED
1941	2,715	1,292	58	1,364	0.5
1942	11,004	4,296	242	6,962	3.4
1943	25,055	9,714	307	15,015	17.5
1944	47,028	13,522	374	33,091	40.2
1945	55,583	13,885	246	41,411	40.5

(In millions of pounds)

The veterinary meat and dairy hygiene operations were twofold in nature: (1) To protect the health of the troops endangered by foods which might be spoiled, damaged, contaminated, and/or unsafe for eating; and (2) To protect the financial interests of the Government by inspecting products to determine compliance with contractual requirements governing their quality and manufacture.⁵

The Army Veterinary Service has provided food inspection support for the QMC throughout the years. The QM Market Center System began in 1941. When the QMC was designated as the sole procurement agency for food products common to the three Armed services, the Army extended veterinary service to the Navy and

the Marine Corps. Since 1942, both the Navy and the Marine Corps have recognized the inspection stamp of the Army Veterinary Service.⁶

During 1944 approximately 4,000 commercial food establishments (only meat and dairy) were being regularly inspected each month. As of June 1945, the establishments disapproved for use by the army because of insanitary conditions totaled more than 1,100 in the United States. These were only fresh meat and dairy products establishments.⁷

The Army Veterinary Service was concerned principally with foods of animal origin, or meat and dairy products, and their sources of supply. However, during the war, large amounts of fruits, vegetables, cereals, and other non-animal products were inspected by the veterinary service. These wartime inspections were limited generally to places where no sanitary inspection agency existed or when specifically authorized/requested by military commanders and/or purchasing agents.⁸

The success of the Army Veterinary Service can be observed by the fact that there is no record that foods, both meat and dairy products and foods other than animal origin, which were issued under Army Veterinary Service supervision, were the cause of food poisoning and/or foodborne disease as a result of their being unsound, unwholesome, or contaminated at the time of their issue. There were outbreaks of foodborne diseases, but they were usually due to messhall practices of poor sanitation and to the use of uninspected foods by the messhalls.⁹ An additional

success is shown by the fact that there were no indications that lessened efficiency of troops in a campaign or the disruption in assault operations occurred as consequences of food poisoning or foodborne disease.¹⁰

The preceding is remarkable considering the problems in the China-Burma-India theater. In the Indian theater, the system of supply involving Indian resources proved very difficult where better grade and sanitary quality foods were expected than in the China theater where the U. S. forces were forced to live off the country. Sanitary and quality factors were found to be below the minimal American standards. Inspections were accomplished in an attempt to continue to provide wholesome food to the troops. Due to the conditions, whole herds of animals were rejected from slaughter. Diseases such as rinderpest, foot-and-mouth disease, and anthrax were among the causes for rejecting so many animals. Additional problems with milk and eggs also existed.¹¹

Similar problems also existed in the China Theater. Serious difficulties were experienced with the supply of adequate potable water and the handling and distribution of the meat where refrigerated facilities were underdeveloped. Only carcass beef was accepted because edible organs generally revealed extremely heavy parasite infestations.¹²

The problems in these two theaters reemphasize the importance of military food inspection in the protection of the health of the troops. Many diseased animals and animal products

were condemned. Thus, unwholesome food was prevented from entering the military food system.

ENDNOTES

1. J.F. Smithcors, The Veterinarian in America, 1625-1975, p. 155.
2. Everett B. Miller, United States Army Veterinary Service in World War II, p. 675.
3. Smithcors, pp. 156-157.
4. Ibid., p. 157.
5. Miller, pp. 675-676.
6. William H. H. Clark, "U. S. Army Veterinary Corps versus the Quartermaster Corps, 1951," unpublished, p. 2.
7. Miller, p. 679.
8. Ibid., p. 681.
9. Ibid., p. 726.
10. Ibid., p. 727.
11. Ibid., p. 347.
12. Ibid., p. 373.

CHAPTER FIVE
FOOD INSPECTION, 1946-1973

Following WWII, military veterinarians assisted the occupied countries in raising herds and flocks which could provide a safe food supply for American troops at overseas sites. American military veterinarians have continued to work with the civilian authorities of these countries in developing large supplies of wholesome milk from disease-free herds.¹ These supplies have provided a safe food supply for American troops for over 45 years.

Military veterinary services established in 1946, a fresh milk supply for troops stationed in Europe through the development of tuberculosis-free areas in Denmark, The Netherlands, Germany, France, and Austria. This program eliminated the necessity for shipping frozen milk from the United States to U. S. troops stationed in Europe.²

The Army veterinary services also developed and supervised a program for concentrating milk in The Netherlands for reconstitution and issue to U. S. Forces in North Africa. Yugoslavia also received assistance from the Army Veterinary Service in developing food hygiene standards.³ This has provided another safe source of food for American troops.

During this period, the Army Veterinary Service continued to provide an outstanding food inspection service meeting the challenges of the Korean War. This period is notable for the changes in the role of the veterinary officer in food inspection as the veterinary service responded to changes in the U. S. food industry, the changing procurement procedures, and the increasing capability of federal agencies, both regulatory for sanitary control of food establishments, as well as for grading and quality control.⁴

In the post war period, a number of charges of duplication of inspection (i.e., foods already inspected by other government agencies) were made against the Army Veterinary Service. At the same time, AMS was increasing their overall inspection capability. The Army Veterinary Service recognized the changes and as a result, several major changes occurred.

(1) In 1952 the AMS assumed poultry inspection and grading on Army contracts.

(2) In 1956 they assumed responsibility for all grading of carcass meats.

(3) Then in 1963, the grading of shell eggs became the responsibility of AMS. The Army Veterinary Service retained the right to dispute gross errors in grading as determined on destination (class 4) inspections. AMS continues today as the sole agency responsible for grading of food products in CONUS. The Army food inspector is still responsible for the grading required in overseas procurement of foods.⁵

As noted in the previous chapter, the Army Veterinary Service has provided food inspection support for the QMC throughout the years. The relationship between the QMC and the veterinary service became strained when the veterinary service entered into the food inspection business. It was the classic conflict between production (QMC) and quality control (Veterinary service). The QMC had little control over the veterinary service since the veterinary services operated under the command control of the Continental Army commanders and under the technical control of the Army Surgeon General. This lack of control over inspectors had always created problems (at least in the minds of the QMC). Thus, in 1951, they decided to gain control of the veterinary inspectors. The QMC recommended to the Under Secretary of the Army that veterinary personnel doing in-plant inspections be transferred to the control of the QMC. The veterinary services' position was that to place a portion of the service under the QMC would be a reversion back to the unsatisfactory arrangement that existed from 1901 until 1916 when the veterinarians were inspecting meat for the Subsistence Corps.⁶

A survey team was organized by the Comptroller of the Army to determine the validity of the QMC request. In April 1952, the decision was made whereby the Continental Army commanders would be assigned full responsibility for veterinary service, to include food inspection performed for QMC. This included responsibility for inspection not only in connection with their

own troops , but also for procurement of food items by the Army, regardless of where they were ultimately consumed.'

In 1966, certain meat and poultry plants under the jurisdiction of State meat inspection systems were approved by the Army Veterinary Service as acceptable sources of foods procured by nonappropriated fund activities. Such procurements were formerly limited to federally inspected establishments. This was a great assist to States in an effort to upgrade their inspection services. In 1967, Congress passed the Wholesome Meat Act which declared that all states must develop a meat inspection system within two years equal to that to the federal system. In 1968, a similar act was passed for poultry inspection. These acts were the first major changes since 1906, and for the first time the federal government recognized its role in protecting the health of the people.⁸

Military food inspection was very important in the 60s with the outbreak of the Vietnam conflict. The activities of food inspection during that era (1962-73) may be reviewed in chapter six of this study.

In 1964, another major change in food inspection occurred as the result of DOD policy pertaining to contractor responsibility for inspection. The contractor now had the responsibility to inspect his products and ensure that they met the contractual requirements prior to becoming government property. The program was implemented with high volume meat items such as boneless beef and semiboneless veal. The program was called "contractor

inspection-Government verification". In the early stages, veterinary personnel were asked to assist in training contractor personnel. The resulting program of statistical sampling and contractor inspection demonstrated several advantages: (1) reduction of veterinary personnel; (2) elimination of 100 percent inspection by veterinary personnel; and (3) establishing of tolerances and objective limits to quality requirements.⁹

In the late 50s and early 60s various voluntary inspection programs were developed by Federal agencies. By 1966, the Armed services recognized the following programs as having adequate sanitary controls and thereby, were exempted from listing in the Directory of Sanitarily Approved Food Establishments for Armed Forces Procurement: (The Directory is a listing of approved food establishments used by contracting and veterinary personnel to determine approved sources of food for procurement. The directories are published by the Commanders, U. S. Army Health Services Command and overseas major commands for their respective areas of responsibility.)

(1) Dairy plants having a pasteurization plant compliance rating of 90 or above as listed in "Sanitation Compliance and Enforcement Ratings of Interstate Shippers", which was published by the U. S. Public Health Service (now under the Food and Drug Administration).

(2) Plants processing fruits and vegetables under supervision of Processed Products Standardization and Inspection Branch, Fruit and Vegetable Division, USDA.

(3) Plants processing fish and other waterfoods under supervision of Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, U. S. Department of Interior (now under U. S. Department of Commerce, National Marine Fisheries Service).

In addition, by 1972, the following were also recognized:

(1) Establishments listed in the "List of Plants Operating under USDA Poultry and Egg Grading and Egg products Inspection Programs" published by the USDA.

(2) Establishments listed in "Dairy Plants Surveyed and Approved for USDA Grading Service" published by the USDA Consumer and Marketing Service.¹⁰

In 1973, an operational system called "DOD Hazardous Food Recall System" was developed. Under the system, the Defense Personnel Support Center (DPSC), Defense Logistics Agency is the responsible agency for receiving, coordinating, and initiating action on reports of hazardous food recalls initiated by any government agency.¹¹ The veterinary service plays a vital role in this system in determining if foods are hazardous and then initiating appropriate action to prevent the hazardous food from being consumed.

ENDNOTES

1. U. S. Congress, Senate, Committee on Government Operations, "Veterinary Medical Science and Human Health," p. 120.

2. Ibid., p. 134.

3. Ibid.

4. Leland B. Carter, "History of Food Inspection by the Army Veterinary Service," unpublished, p. 13.

5. Ibid., p. 3 (appendix III).

6. William H. H. Clark, "U. S. Army Veterinary Corps versus the Quartermaster Corps, 1951," Unpublished, p. 5.

7. Ibid., p. 10.

8. Carter, p. 5 (appendix III).

9. Ibid.

10. Ibid., p. 7.

11. Ibid., p. 8.

CHAPTER SIX

FOOD INSPECTION DURING VIETNAM (1962-73)

As a result of changes in technology and training from WWII to the era of Vietnam, the Army Veterinary Service performed very effectively and efficiently during this era. Very few mistakes were made in food inspection programs, even though the situation was extremely difficult and the problems were numerous. There was little the veterinary service could do about the lack of storage space, the tremendous amounts of food, the inexperience of the logistics systems, or the poor management of the food products by the logistics community. Sufficient veterinary personnel were lacking. Even under these difficult circumstances, the veterinary service proved invaluable, especially where the inspectors were aggressive to the point of taking an active part, if necessary, in the operation of the class 1 (subsistence) facility. The veterinary service performed well enough that in spite of all the problems, foodborne illness was never reported as a significant problem to the health of the command.¹

There are two different steps in a military food inspection program: (1) determination of local sources of food, and (2) inspection of stored food (surveillance inspections). Even

though there are two different steps, one cannot separate them into two distinct areas. There will always be some overlap as evidenced by the following discussions.

One of the initial steps in a military food inspection program is to find local sources that can provide food that is safe and wholesome. This was a major problem in Vietnam as there were no sanitary sources and the supply line reached halfway around the world.²

In 1962, President Kennedy decided on a substantial increase in U. S. support. The number of U. S. military personnel grew from approximately 3,000 to over 11,000.³ As the number of advisors increased, so did the cases of hepatitis and diarrhea.

By the time the first veterinarian arrived in Vietnam in May 1962, the Navy was buying food items from a number of local establishments. These establishments had never been checked for sanitation. Local bakeries had no concept of sanitation. The fresh fruits and vegetables being purchased from the Saigon Central Market probably were grown in night soil (human excrement). The water being used for ice was not being chlorinated. The perishable food products, arriving from overseas, were usually in poor condition by the time they reached the Saigon port. It was evident that food inspection was a major problem in Vietnam.⁴

In July 1962, the first U. S. Army Veterinary team assigned to Vietnam arrived. It was not a part of the advisory effort, but was sent to provide food inspection support to the many U. S.

advisors and support personnel who were a part of the new buildup.⁵

However, as the buildup increased, the veterinary service became overwhelmed. The main depots were supported, but the forward issue points were only supported in response to specific problems. It was not until 1968 when eight new veterinary units arrived that there was a sufficient number of inspection personnel to provide adequate food inspection coverage. A significant decrease in the food condemnation rates validated the economic importance of a good food inspection system.⁶

Some of the problems encountered were that warehousing and storage facilities around the port were scarce, substandard, and overcrowded. Food items had to be stored in the open at times where they were exposed to the sun and the rain.⁷ Commercial refrigeration and freezer space was almost nonexistent. Frozen meats were given priority for the frozen food storage space available, but this could only hold temperatures down to about 15 degrees F. Eggs and dairy products received next priority with fresh fruits and vegetables getting whatever space was left over. Losses of fresh fruits and vegetables were significant. One example was the loss of 4,000 out of 11,000 cases of tangerines, and 6,000 out of 20,000 cases of potatoes, all due to inadequate refrigeration, i.e., the food rotted due to a lack of proper temperature.⁸

The troop buildup was accompanied by a tremendous buildup of subsistence that always seemed to exceed the inspection

capability of the veterinary service. The shortage of personnel was probably the single most important limiting factor associated with early veterinary support in Vietnam.⁹

In 1966, a vast new system of depots, Class I (subsistence) yards, and issue points were developed to distribute the massive quantities of food delivered to the ports of Saigon, Cam Ranh, Qui Nhon, and Da Nang. The additional inspection points only increased the problems of the veterinary personnel attempting to provide inspection services.¹⁰

An additional single factor that so profoundly affected the food inspection system was the arrival of the first SeaLand vans in November 1967. Each van was equipped with its own individual self-contained refrigerator unit. The products could be issued directly from the vans to the ration trucks, thus decreasing the need for refrigerated storage at the depots and supply points.¹¹

The procurement of dairy products in Vietnam was a major problem. There was practically no dairy industry in Vietnam. Dairy products were initially received on refrigerated ships from CONUS. The lack of available refrigeration space just added to the problem. In 1965, Foremost Dairy opened its first filled milk plant just north of Saigon. It had its own built-in water supply, a sewage treatment plant, and a laundry. It became a very important source of ice cream, both white and chocolate milk, and cottage cheese. Veterinary personnel established a quality control program and assisted the management in training the Vietnamese labor force in sanitation and quality control.¹²

Meadowgold Dairies received a contract to build two additional dairies. One opened in November 1967 while the other one opened in February 1968. The three dairy plants were still not able to meet the demands for fresh milk. Eventually, five filled milk plants would be built in Vietnam. Ice cream proved to be such a morale factor that the Army also installed some forty small ice cream plants in the less accessible locations of Vietnam.¹³

Providing an adequate supply of ice was another major problem throughout the country. The water used to make local ice was not chlorinated and therefore, presented a significant health hazard due to viral hepatitis. The first approved source of ice was a French company that had a brewery and the only Coca Cola franchise in Vietnam. The approved ice needed to be identified by some means. The veterinary service planned to identify it by adding an approved Food and Drug Administration (FDA) dye. One of the greatest debates at the officers' club was what color should the approved ice be. General Joe Stillwell, Commander of U. S. Army Support Group, Vietnam felt that there was nothing like a martini with blue ice. Therefore, the approved ice became blue.¹⁴

The second step of a military inspection program is the periodic inspection of the subsistence while in storage. By 1966, vast quantities of food were being delivered to the ports. The increased number of facilities stretched the inspection capability of the limited number of inspection personnel.¹⁵

Supplies arrived in such great volume during the buildup that it was almost impossible to keep track of where they were stored. Stocks bulged far in excess of what could be consumed before they deteriorated. These excess stocks represented safety factors against a myriad of possible resupply problems envisioned in a combat theater. The saving factor in the food supply chaos was simply the overabundance of food that continued to flow into the country. The rotation policy became one of last-in first-out, which was a reversal of normal practice, but it would have taken years to eat their way through the older stocks.¹⁶

In 1971, the troop draw down started and the problems of overaged items and distressed nonperishable items became even greater. Many of the items had already passed their expected shelf life prior to entering the country. The extreme heat and humidity rapidly reduced the remaining shelf life. At the same time, a new command policy that required fresh rations be fed, whenever possible, was implemented. The requirement for canned rations was drastically reduced.¹⁷

The enormous quantities of food inspected is emphasized by

the following table which shows the inspection of food by the veterinary service in Vietnam from 1965-70:¹⁹

YEAR	GRAND TOTAL (BILLIONS)	PROCUREMENT		SURVEILLANCE	
		PASSED (MILLIONS)	REJECTED (MILLIONS)	PASSED (MILLIONS)	REJECTED (MILLIONS)
1965	1.1	50.4	.19	1128.9	.78
1966	8.9	451.4	.65	8515.5	9.66
1967	13.5	1009.6	11.90	12449.5	35.34
1968	10.1	1480.9	8.23	8621.4	52.45
1969	7.1	898.6	7.83	6238.1	26.59
1970	3.7	549.2	1.11	3112.5	4.99

It is evident from these figures that the veterinary service had an important mission of food inspection during the Vietnam conflict. During the era, the Army Veterinary Service continued to provide food inspection services of the highest quality. During this conflict, there was again no significant affect by foodborne disease on U. S. military operations. This is additional proof of the value of the Army Veterinary Service in supporting the U. S. soldiers. As a result of the lessons learned in Vietnam, the Army Veterinary Service would continue to improve and increase their capability to provide services to the military.

ENDNOTES

1. William H. H. Clark, "The History of the United States Army Veterinary Corps in Vietnam, 1962-1973," p. 18.
2. Ibid., p. 2.
3. Joseph M. Heiser, Jr., Vietnam Studies-Logistic Support, p. 14.
4. Clark, p. 4.
5. Ibid., p. 6.
6. Wallace L. Anthony and Mylo Hagberg, "Medical Support of the U. S. Army in Vietnam," p. 25.
7. Heiser, p. 18.
8. Anthony and Hagberg, p. 37.
9. Ibid., p. 30.
10. Clark, p. 12.
11. Ibid., p. 13.
12. Anthony and Hagberg, p. 28.
13. Clark, p. 17.
14. Ibid., p. 19.
15. Ibid., p. 22.
16. Anthony and Hagberg, pp. 32-33.
17. Clark, p. 26.
18. Anthony and Hagberg, p. 31.

CHAPTER SEVEN
FOOD INSPECTION, 1970-PRESENT

The decade of the 1970s was to be seen as one of the most exciting in the history of the Army Veterinary Service. There would be numerous studies and events that would eventually result in the greatest changes in the veterinary service since WWII.

A General Accounting Office (GAO) study in June 1970 entitled "Need to Reassess Food Inspection Roles in the Federal Government" was the first of many studies involving the veterinary service. The federal agencies primarily involved included the Departments of Agriculture; Defense; Health, Education, and Welfare (HEW); and Interior. Both the legislation and the regulations governing federal food inspection had evolved a piece at a time in order to solve the problems at that current time. For example, the Army, USDA, FDA, and State and local agencies were all involved in inspecting dairies. This created a lot of dissatisfaction within the processing industry.¹

The GAO study recommended that a detailed evaluation of the federal food inspection system be made by the agencies involved. The effort resulted in changes in which the military food inspection service would (1) recognize the USDA sanitary surveillance of approved foreign meat establishments, (2)

recognize the FDA Interstate Milk Shippers List for dairies, and (3) recognize the sanitary surveillance of the USDA over cheese and butter plants.²

In 1971, Senator Edward Kennedy introduced a bill directing the Secretary of Defense and the Secretary of HEW to determine the means of meeting medical needs of the military, but through less dependence on military medical personnel. As a result, the duties of the veterinarian in food inspection were not recognized as a legitimate duty. The Assistant Secretary of Defense (Health and Environment) wanted the food inspection mission to be a part of the mission of qualified nonprofessional veterinary service personnel. The veterinary service responded by saying that extreme caution needed to be exercised in regulating the mission.³

The Army Veterinary Service held the opinion that, over the years, the military had seen a time of relative freedom from foodborne illness that had formerly plagued the soldier. Numerous military dollars had been saved by assuring that food received was wholesome and of the quality specified by contract. The use of nonprofessionals would be feasible only if veterinarians continued to manage and supervise the nonprofessionals. Replacement of veterinarians by this group was not recommended overseas due to the lack of the safeguards available in the U. S. from other governmental agencies. The study finally concluded that the veterinary function of food inspection was valid.⁴

Then in February 1973, another study was undertaken. This was a program analysis of the Army Veterinary Services by the Department of the Army Comptroller. This study group concluded that the standards for wholesomeness and quality of food stuffs procured for troop consumption were justifiably more stringent than those for civilian products due to transportation, lengthy storage requirements, and their impact on military operations. The group felt that the veterinary service performed the food hygiene and quality assurance function in a professional and efficient manner, utilizing the services of non-DOD federal agencies when appropriate, but never compromising the quality of food for the soldier. The recommendations of the study were never implemented. When it reached its way to the Assistant Chief of Staff of the Army, he thought the study was a bad idea. A memorandum was published revoking the study and thus, another study was without substance.⁵

In February 1974, the GAO conducted an investigation on the assessment of the use of Doctors of Veterinary Medicine by DOD. They found that the veterinary service was providing an essential function to the military defense and providing it in a cost effective manner. GAO could find no other qualified agency which could perform the services more cost effectively. No written report would be produced as the GAO does not give "White Hat" reports.⁶

Then in August 1974, the Army Audit Agency did a study on the utilization of veterinarians. The study used the 1973

Department of the Army Comptroller study and found that the increased use of other governmental agencies or contractors was not feasible. Nothing was ever heard from the study.⁷

In November 1974, GAO performed a review of utilization and need for military doctors of veterinary. They concluded that as a professional advisor and practitioner, the veterinarians were being used at a professional level, but their duties in administration, food inspection, and sanitary inspections did not always require their professional expertise. GAO suggested that specialty trained semi-professional commissioned or warrant officers be placed in charge of installation veterinary activities in the U. S. This would have resulted in the reduction of 279 veterinarians on military installations.

The study was staffed with other agencies who were receivers of the Army Veterinary Services. The agencies (Navy, Army and Air Force Exchange Service, USDA, DPSC) answered the call and supported the efforts of the Army Veterinary Service. The Army Surgeon General also stated that this was the fourth major external review of the Army Veterinary Services since 1971 and that two additional internal reviews had been conducted at the same time. He felt excessive attention was being focused on the Army Veterinary Services which had performed as an essential and integral part of the Army Medical Department in supporting the Department of Defense. As a result of the support received from other agencies, the audit died and was never heard of again.⁹

In December 1974, an event took place that was rather undramatic within itself, but it initiated a cascade of studies that produced major changes. A meat packer in Miami had some boneless beef (diced beef) rejected by Army food inspectors. He had been doing business with the military for a long time. The packer could not understand how he could hand-cut the diced beef and have it rejected while a relatively new company in Boston could cut beef on a machine and have it accepted. In May and June 1975, the meat packer in Miami sent letters to his senator complaining of his treatment by the military. On 5 June 1975, Senator Chiles from Florida and his subcommittee requested a list of fabricated (diced) beef contractors be provided to him. In July 1975, it was requested that an audit be performed on all DOD meat procurement. The audit revealed that over 60 percent of the frozen fabricated beef products were nonconforming in some degree with the specification. As a result, DOD requested that a thorough examination be conducted of the entire meat acquisition system.⁹

The events that followed came to be known to the Army Veterinary Service as the "Boston Massacre". A veterinary technical liaison team from the Academy of Health Sciences, Fort Sam Houston, Texas, went to Boston to investigate the complaints. At the meat company they found numerous deficiencies with both the company and the food inspection service. The officer-in-charge and the other inspectors were relieved and replaced with adequately trained individuals. An anonymous letter was received

by Chiles' subcommittee pointing out the deficiencies and the crimes being committed by the company and the inspectors. As a result, the Defense Investigative Service started an investigation in July 1975. They found most of the problem to be in Boston, but irregularities were also found in Dallas/Fort Worth, Chicago, and Alameda. The subcommittee issued subpoenas for the companies involved. Records were reviewed by the subcommittee. A federal grand jury brought a 51 count indictment against the owners of several firms for bribery, conspiracy to upgrade meat, falsely labeling cuts of meats, and substitution of meats.¹⁰

In November 1975, DOD formed a task force group on subsistence procurement. The group met for eleven months and found that several things were needed to improve the system. The changes dealt with procurement and supply, subsistence specifications, and quality assurance.¹¹

Several other investigations resulted. The Army had a General Officer AdHoc Committee on Subsistence in May 1976. The House Appropriations Committee (HAC) conducted an inquiry concerning DOD procurement and inspection of meat in July 1976.¹²

When the report of the HAC for the FY78 budget was published, it contained recommendations that the responsibility of origin (class 3) inspection of meat and other food products be transferred from the military veterinary services to the USDA. This was to commence on 1 July 1976.¹³

The transfer of food inspection functions from DOD to other federal agencies had been taking place for some time. In previous chapters of this study, it was noted that all grading of carcass meats were transferred to USDA as well as grading of shell eggs and egg products.¹⁴ Other examples may be seen in chapter five of this study project.

In August 1979, DOD sent to the services a Program Decision Memorandum for FY81. The memorandum was a very important document in the history of the Army Veterinary Service. The document recommended the disestablishment of the Air Force Veterinary Service. Adjustments of strength would also occur. When the Senate agreed, the fight to retain the Air Force Veterinary Service had been lost. On 7 December 1979, Congress passed the FY80 DOD Appropriation bill and two weeks later, President Carter signed it into law. It directed that the Air Force Veterinary Services be disestablished not later than 31 March 1981. At that time, the Army would assume Executive Agency for all DOD veterinary functions.¹⁵

In July 1980, it was determined that the appointment of the Army as Executive Agent would become effective 1 October 1980. It was still the Army's responsibility to do food inspection, but DOD did not stipulate which personnel, veterinary or other, would perform the mission. The Surgeon General planned to develop a cadre of warrant officers, already trained in food inspection, rather than develop a new career group that would require training.¹⁶

As a result, the concept of a veterinary warrant officer program was developed. The program would consist of senior NCOs of the veterinary service who were already trained in food inspection. The concept was approved by Congress in September 1980. From October 1980 until April 1981, A DOD and a DA course concept letter was developed. At the same time, a program of instruction was developed for veterinary warrant officers at the Academy of Health Sciences, Fort Sam Houston was developed. From May until June 1981, recruitment was held to obtain candidates for the program. In July 1981, the warrant officer selection board was convened. Ten individuals were selected for the first class which was to begin in November 1981. The first class graduated on 19 December 1981. Two additional classes were held in FY82 and FY83. By the end of FY83, there were 53 warrant positions for the Army Veterinary Service. The warrant officers were called Food Inspection Technicians. In the latter part of the 80s, that name created problems since some confused the veterinary warrants with the Food Service warrants. As a result, the name was changed to Veterinary Services Technicians. This helped prevent confusion as to the specialties of both groups.¹⁷

As a result of consolidation and the Army becoming the executive agent for veterinary matters, the Army Veterinary Service assumed the DOD Subsistence Inspection functions. These functions were:

- 1) Prevent entry of unsuitable or unsafe food into the supply system.

2) Minimize financial loss from improper purchases or handling of food.

3) Prevent distribution, issue, or sale of unsafe foods.

4) Provide uniform application of standards and procedures through central technical and professional management.

5) Provide independent judgement rendered impartially with professional credibility.

6) Provide same service to worldwide military community that civilians receive from their state and local governments.

7) Integrate efforts of other regulatory agencies.

8) Provide basic resource for NBC surveillance of subsistence in times of suspected contamination.

9) Monitor the production, processing, shipping, storage, issue, and shelf life of operational rations to ensure wholesome and palatable rations are available to the soldier whenever operational rations are needed.¹⁸

The consolidation and transfer of mission responsibility was completed in September 1983. The Army Veterinary Service, in addition to its own installations, is responsible for 10 Defense Logistics Agency sites, approximately 91 Navy/Marine Corps bases, and approximately 117 Air Force Bases. The Army also has responsibility for food inspection activities to the Army, Navy, Marine Corps, and joint service activities to ensure wholesomeness, safety and quality, offshore procurement inspections, and sanitary control of food processing plants such as meat plants, dairies, and ration assembly plants.¹⁹

The U. S. Army Veterinary Detachment, Europe is a unique veterinary unit that was organized to accomplish specialized veterinary missions throughout Europe. This unit provides origin food procurement inspections to commercial food plants in Denmark, Norway, Sweden, Finland, Scotland, Iceland, Greenland, The Netherlands, Luxembourg, Belgium, France, Spain, Austria, Yugoslavia, England, Wales, Northern Ireland, the Azores, and Germany. In 1983, the unit inspected in excess of 250 million pounds of subsistence valued at over 150 million dollars.²⁰

Another example of the efforts/successes of the Army Veterinary Service can be shown by the following situation. During the first week of March 1986, Health Services Command, Fort Sam Houston, Texas, veterinary inspection personnel detected a significant increase in the number of visual leakers and swellers in thermostabilized entree food pouches throughout the four Meal, Ready-to-Eat (MRE) ration assembly plants. Due to the significant increases, the four assembly plants were closed on 7 March 1986. The nonconforming products were identified as being manufactured by one company. Approximately 210,000 assembled cases of 1986 date of pack MREs were placed on medical hold. Following inspection and testing of several products, assembly plants were allowed to start production once again on approximately 12 March 1986. During the following weeks, the Army veterinary service in cooperation with USDA, Natick Research, Development, and Engineering Center, and DPSC, evaluated the problem of microleaks in the entree packages.

Actions were taken to control/eliminate the problems. In May 1986, addition concern was voiced to the Surgeon General by Health Services Command. As a result, MREs produced in 1983-1986 were suspended from use pending further testing and evaluation. In addition to performing wholesomeness inspections on the MREs, a special program for the determination of serviceability was developed. The samples were tested for microholes and were screened microbiologically for the presence or absence of pathogens and/or spoilage organisms.²¹

In June 1986, the Under Secretary of the Army directed that the serviceability, microbiology, and microhole screening plan be implemented. He also directed that a multi-disciplinary task force of experts be dispatched and recommend any and all appropriate action necessary to correct the problems.²²

The MRE Task Force established by the Department of the Army Deputy Chief of Staff for Logistics (DCSLOG) made 50 recommendations with 49 subtasks to enhance the packaging, improve the ration, tighten preaward survey parameters, and establish better plant processing controls. Implementation of the recommendations helped improve both the ration and the packaging quality. The Army Veterinary Service played an important role in the task force. It was headed by a former Veterinary Corps Chief and two additional veterinarians were part of the task force.²³

In August 1987, the Army Veterinary Service again played an important role in protecting the operational rations of the

military. Food inspectors in Panama found rusted and leaking tray pack cans in two lots of tray packs produced in 1983 and 1984. Tray pack cans are a two piece retortable institutional size can that were developed for use as an operational ration for the Army. DPSC reported other leaking cans had been found by other inspection personnel at several additional sites. As a result, a tray pack task force was formed by DCSLOG. One military veterinarian was a member of this task force. Recommendations were made for can handling, can design, construction of the can, and the use of good operating practices.²⁴ This task force probably helped to prevent the recall and increased logistics of a recall of many thousands of tray pack items. This was due to the identification of the problem and then recommended actions to prevent the problem in the future.

This period can be characterized by numerous studies and reviews of the Army Veterinary Service in attempts by several individuals and organizations to get rid of the Army Veterinary Service. However, each failed in their attempt. This was due to the important function of food inspection performed by the veterinary service in a highly professional cost-effective manner, which can not be matched by any other agency. The Army Veterinary Service again proved that it was needed, i.e., it performed the important functions of protecting the health of the troops and protecting the financial interest of the government.

ENDNOTES

1. William H. H. Clark, "Fight for Survival: The Administrative History of the United States Army Veterinary Corps, 1971-1983," p. 6.
2. Ibid., p. 7.
3. Ibid., pp. 14-15.
4. Ibid., pp. 15-16.
5. Ibid., pp. 17-20.
6. Ibid., p. 22.
7. Ibid., pp. 22-24.
8. Ibid., p. 24-28.
9. Ibid., p. 30-35.
10. Ibid., p. 35-43.
11. Ibid., p. 50-54.
12. Ibid., p. 54-60.
13. Ibid., p. 69.
14. Leland B. Carter, "History of Food Inspection by the Army Veterinary Service," unpublished, p. 12.
15. Clark, p. 139-158.
16. Ibid., p. 160-172.
17. Personal notes.
18. Ibid.
19. Ibid.
20. James E. Drolte, "U S Army Veterinary Detachment, Europe," p. 21.
21. Henry W. Derstine, "Report on Meal, Ready-to-Eat (MRE) Status-Information Memorandum," 12 June 1986.
22. Ibid.

23. Department of the Army, Office of the Deputy Chief of Staff for Logistics, Report by Meal, Ready-to Eat (MRE) Task Force, pp. 6-1 thru 6-15.

24. Department of the Army, Office of the Deputy Chief of Staff for Logistics, Report by Tray Pack Task Force, p. 1-2.

CHAPTER EIGHT

FOOD INSPECTION: ITS EFFECT ON READINESS

Medical readiness is a vital function of the U. S. Army Veterinary Service. Veterinary support in a theater of operations is organized to provide Corps-level support to :

1) ensure that all subsistence, entering, stored, or issued in a theater of operations meets food wholesomeness, hygiene, safety, and quality assurance standards.

2) prevent unnecessary loss of military manpower by establishing appropriate control programs to prevent those diseases and conditions transmitted from animals to man.

3) ensure that veterinary medical units can respond quickly to rapidly changing tactical situations.¹

Concerns for readiness go back to the dawn of recorded warfare, Sun Tzu (400-320 B.C.) wrote in The Art of War:

"It is a doctrine of war not to assume the enemy will not come, but rather to rely on one's readiness to meet him; not to presume that he will attack, but rather to make one's self invincible."²

Not only does the U. S. Army Veterinary Service need to maintain readiness, but the veterinary service has to ensure that other military unit's readiness is not affected by consuming

unwholesome food. The importance of disease in combat has repeated itself throughout history. With the development of successful vaccines and effective drugs for prophylaxis and treatment, many infectious diseases such as smallpox, plague, cholera, and yellow fever have been greatly eliminated. Now, enteric infections have become increasingly or relatively important.

The ability of enteric disease to render large numbers of combatants ineffective in a short period of time makes these diseases a potent threat to military personnel in a combat role.³ For example, diarrheal disease was the third leading cause for hospitalization during the Vietnam war. In addition, U. S. Marines in Lebanon in 1958 had a 25 percent incidence of bacillary dysentery which severely restricted combat readiness. In 1982, U. S. Marines in Lebanon experienced a 2-9 percent diarrheal attack rate with 0.5-2.5 percent of the force requiring hospitalization.⁴

There are a number of diarrheal diseases that have been identified as diseases of military importance. Those identified, just to name a few, are bacillary dysentery, Enterotoxigenic E. coli, Salmonellosis, Hepatitis A, and cholera. The mode of transmission for most of these diseases is contaminated food and water. Diarrheal diseases can last anywhere from 24 hours to several weeks. The prevention and/or control measures necessary

are sanitary processing and preparation of food, pasteurization of milk, avoidance of local vendors and personal hygiene practices.⁵

Keeping soldiers healthy is essential for combat readiness--especially in the desert, where dehydration and diarrheal diseases have been known to immobilize troops.⁶ Diarrheal disease is still a major problem in combat troops unless precautions are taken.

A modern military force must be able to deploy rapidly, engage in combat immediately, and fight a sustained battle. The potential of enteric disease to reduce combat effectiveness is a major concern of the Army Veterinary Service. Every soldier is a critical asset. A reduction in enteric diseases will help ensure a more effective fighting force. The majority of preventative measures to control the diarrheal diseases are measures taken by the veterinary service while performing their mission of protecting the health of the troops.

Even though the veterinary services play a major role in controlling diarrheal diseases, extensive indoctrination programs are needed evolving around sanitation, personal and field hygiene, and epidemiology of disease, in order to inform major commanders and their troops of the additional hazards they face in combat other than the seen enemy.⁷ It is the unseen enemy that has created complications for many commanders throughout history.

The reduction in the incidence and mortality of disease since the Civil War is a result of the efforts of the Army Medical Department and the Army Veterinary Service. The following data provides some medical statistics that shows the progress that has been made:

WAR	NON-BATTLE DEATHS(DISEASE)
Civil War(North)	233,789
World War I	51,447
World War II	14,243
Korea	2,410

It is still well to remember that contaminated food and water are still the most reported way of dissemination or spread of the diarrhea diseases. Investigation of localized periodic outbreaks of enteric disease usually reveals a breakdown in the system, often either in the training of personnel, or an excessive workload in the supervision of untrained personnel.⁸

A former Surgeon General of the Army made the following statement concerning the Army Veterinary Service after WWII:

"Enormous quantities of perishable foods were procured, shipped, and distributed on a world-wide basis, on a heretofore unimaginable scale, under the most adverse conditions. It is impossible to over emphasize the contributions to the war effort made by the Veterinary Corps in the maintenance of the health of the Army by its food inspection services."⁹

The statement is still true of the efforts of the veterinary service today.

The importance of the army veterinary service to readiness can be shown by the fact that if military veterinarians are responsible for inspecting approximately 6.5 billion dollars worth of government procured/owned subsistence in 1988, then each

of the 286 veterinary officers is theoretically responsible for 22.7 million dollars worth of food. Current estimates for the cost of foodborne disease in the United States amounts to 480 million dollars in direct patient care costs; lost duty hours or non-effectiveness would add to these figures. The threat of diarrheal disease in the U. S. is still the number one U. S. health problem with respect to number of cases reported. Estimates of the true significance of this disease in the U. S. suggest that 1.5 percent of the population is affected each year; this incidence estimate extrapolated to the military community amounts to approximately 73,500 cases per year. The military veterinary service is an integral part of the DOD health care team responsible for minimizing the cases of foodborne disease in the defense community each year.¹⁰

It is very important that in the planning for the medical support of the U. S. soldier that the Army Veterinary Service address those items that will have a major impact on our combat forces. The veterinary service has considered the importance of mobilization during wartime. As a result of becoming the DOD Executive Agent for veterinary services, the exact requirements for veterinary services to support all services during mobilization was not known. As a result of a study accomplished in December 1983, it was shown that the total requirements for Veterinary Corps officers during full mobilization would be in excess of 1300. The majority of the increase in officers was to

support the mission of food wholesomeness, hygiene, and quality assurance. Additional veterinary support was needed for USDA, U. S. Department of Commerce (USDC), and other federal agencies involved in inspecting food. The additional support would provide additional assurance in providing wholesome quality food to the military.¹¹

In June 1987, a final report on the Veterinary Mobilization Study was completed. This study verified the requirements for non-DOD agencies such as USDA, and USDC. It was determined that an additional 183 officers were needed to support mobilization. This increased the support to USDA and USDC to 250 officers. Of the 250 officers, 175 were in support of food procurement and quality assurance inspections.¹²

History has shown that where military medicine has succeeded it has done so only by mobilizing its resources well in advance of war and that where it has failed, it has been because it did not recognize the coming needs.¹³ The Army Veterinary Service has certainly recognized the need to assist in maintaining the readiness of the fighting troops.

Army veterinarians have evolved from the farrier/equine doctors of the Civil War era to modern day, highly trained and skilled epidemiologists and biomedical scientists. The U. S. Army Veterinary Service, although a relatively small part of the Army Medical Department, is providing substantial contributions to medical and defense readiness and to the quality of life of the defense community.¹⁴

Currently, Operation Desert Storm serves to reemphasize the overriding importance of the military veterinary services and the dedication to our nation.¹⁵

ENDNOTES

1. Henry W. Derstine, Information Paper-Mission of the U S Army Veterinary Corps, p.3.
2. Jay M Shafritz, Todd J. A. Shafritz, and David B. Robertson, Dictionary of Military Science, p. 383.
3. Gary Pazzaglia and Richard I. Walker, "A Retrospective Survey of Enteric Infections in Active Duty Navy and Marine Corps Personnel," p. 27.
4. Michael E. Kilpatrick and James E. Sheffield, "Illness in American Military Men in Egypt," Military Medicine, p. 548.
5. Defense Intelligence Agency, Handbook of Diseases of Military Importance, pp. 3, 9, 11, 29, and 39.
6. Sally Squires, "Harsh Conditions Pose Hazard to GIs in Persian Gulf," Washington Post, 9 October 1990, p. 14.
7. John P. Heggars, "Microbial Invasion-The Major Ally of War (Natural Biological Warfare)," Military Medicine, p. 393.
8. Leland B. Carter, "History of Food Inspection by the Army Veterinary Service," p. 13.
9. Ibid., p. 12.
10. American College of Veterinary Preventive Medicine, "Profile-The U. S. Army Veterinary Corps Today," p. 3.
11. C. Donald Seedle, "Veterinary Doctrine in Support of Mobilization," December 1983.
12. Henry W. Derstine, "Final Report on Veterinary Mobilization Study," p. 1.
13. John F. Beary, III, "Strategic Planning: Military Medicine in the Eighties," Military Medicine, p. 181.
14. American College of Veterinary Preventive Medicine, p. 4.
15. Paul Zuziak, "Military Veterinarians Key Public Health Role In Operation Desert Shield," Journal of American Veterinary Medical Association, p. 1267.

BIBLIOGRAPHY

- American College of Veterinary Preventive Medicine. "Profile-The U.S. Army Veterinary Corps Today." ACVPM Newsletter, August 1989, pp. 1-4.
- Anthony, Wallace L., and Hagberg, Mylo. "Medical Support of the U.S. Army in Vietnam." Washington: Office of the Surgeon General, unpublished, undated.
- Beary, John F. III. "Strategic Planning: Military Medicine in the Eighties." Military Medicine, Vol. 149, April 1984, pp. 181-183.
- Brown, John Sloan. "Of Battle and Disease: The East African Campaign of 1914-18." Parameters, Vol. XII, No. 2, June 1982, pp. 16-24.
- Carter, Leland B. "History of Food Inspection by the Army Veterinary Service." Unpublished, undated.
- Clark, William H.H. "The Fight for Survival: The Administrative History of the United States Army Veterinary Corps, 1971-1983." Falls Church, VA: Office of the Surgeon General, unpublished, 1987.
- Clark, William H.H. "The History of the United States Army Veterinary Corps in Vietnam, 1962-1973." Falls Church, VA: Office of the Surgeon General, unpublished, 1987.
- Clark, William H.H. "U. S. Army Veterinary Corps verses The Quartermaster Corps, 1951." Falls Church, VA: Office of the Surgeon General, unpublished, 1987.
- Defense Intelligence Agency. Handbook of Diseases of Military Importance. Fort Detrick, MD: December 1982.
- Derstine, Henry W. "Final Report on Veterinary Mobilization Study." Falls Church, VA: Office of the Surgeon General, June 1987.
- Derstine, Henry W. "Information Paper-Mission of the U S Army Veterinary Corps." Falls Church, VA: Office of the Surgeon General, June 1986.
- Derstine, Henry W. "Report on Meal, Ready-to Eat (MRE) Status-- Information Memorandum." Falls Church, VA: Office of the Surgeon General, 12 June 1986.

- Drolte, James E. "U S Army Veterinary Detachment, Europe." Medical Bulletin of the U S Army, Europe, Vol. 43, No. 1, January 1986, pp. 21-23.
- Garrison, F. H. Notes on the History of Military Medicine. Washington: Association of Military Surgeons, 1922.
- Hegggers, John P. "Microbial Invasion-The Major Ally of War (Natural Biological Warfare)." Military Medicine, Vol. 143, June 1978, pp. 390-394.
- Heiser, Joseph M. Jr. Vietnam Studies-Logistic Support. Washington: Department of the Army, 1974.
- Kilpatrick, Michael E., and Sheffield, James E. "Illness in American Men in Egypt." Military Medicine, Vol. 151, October 1986, pp. 548-549.
- Kuechel, Edward F. "Chemicals and Meat: The Embalmed Beef Scandal of the Spanish-American War." Bulletin of the History of Medicine, Vol. 48, 1974, pp. 249-264.
- Lytle, George A. "The United States Army Meat Supply." Journal of the American Veterinary Medical Association, Vol. LVII, No. 10, April to September 1920, pp. 165-175.
- "Meat For the Multitudes." The National Provisioner, Vol. 185, No. 1, 4 July 1981, pp. 26-277.
- Merchant, I. A. and Packer, R. A. Veterinary Bacteriology and Virology. Ames, IA: Iowa University Press, 1967.
- Merillat, L.A., and Campbell, D.M. Veterinary Military History of the United States. Chicago: Veterinary Medicine Corporation, 1935.
- Miller, Everett B. United States Army Veterinary Service in World War II. Washington: Office of the Surgeon General, 1986.
- Miller, Everett B. "Veterinary Medical Services of the Army in the Spanish-American War, 1898 (with Notes on the "Embalmed Beef" Scandal)." Veterinary Heritage, Vol. 11, No. 1, February 1988, pp. 14-38.
- Morse, C.F. "History of the U. S. Army Veterinary Corps in World War I." Unpublished, undated.
- Otis, General Glenn K.; Kroesen, General Frederick J.; and Wagner, General Louis C., Jr. "Our Deployment into the Persian Gulf-Three Views." Army, Vol. 40, No. 11, November 1990, pp. 11-18.

- Pazzaglia, Gary, and Walker, Richard I. "A Retrospective Survey of Enteric Infections in Active Duty Navy and Marine Corps Personnel." Military Medicine, Vol. 147, January 1982, pp. 27-33.
- Risch, Erna. Quartermaster Support of the Army-A History of the Corps, 1775-1939. Washington: Government Printing Office, 1962.
- Seedle, C. Donald. "Veterinary Doctrine In Support of Mobilization." Washington: Office of the Surgeon General, December 1983.
- Shafritz, Jay M.; Shafritz, Todd J. A.; and Robertson, Davis B. Dictionary of Military Science. New York: Fact on File, 1989.
- Sinclair, Upton. The Jungle. New York: The New American Library, Inc., 1905.
- Smithcors, J. F. The Veterinarian in America, 1625-1975. Santa Barbara, CA: American Veterinary Publications, Inc., 1975.
- Squires, Sally. "Harsh Conditions Pose Hazard to GIs in Persian Gulf." Washington Post, 9 October 1990, p. 14.
- U. S. Congress. Senate. Committee on Government Operations. "Veterinary Medical Science and Human Health." 86th Congress, Washington: Government Printing Office, 1961.
- U. S. Departments of the Army and Navy. Army Regulation 40-657, Navy Supply Instruction 4355.4F, Marine Corps Order P10110.31G: Veterinary/Medical Food Inspection and Laboratory Service. Washington: 19 July 1988.
- U. S. Department of the Army. Office of the Deputy Chief of Staff for Logistics. Report by Meal, Ready-to-Eat (MRE) Task Force. Washington: July 1986.
- U. S. Department of the Army. Office of the Deputy Chief of Staff for Logistics. Report by Tray Pack Task Force. Washington: August 1987.
- U. S. Department of the Army. Office of the Surgeon General. Report of the Surgeon General to the Secretary of War, 1918. Washington: Government Printing Office, 1918.
- U. S. Department of the Army. Office of the Surgeon General. Report of the Surgeon General to the Secretary of War, 1922. Washington: Government Printing Office, 1922.

- U. S. Department of the Army. Office of the Surgeon General.
Report of the Surgeon General to the Secretary of War, 1935.
Washington: Government Printing Office, 1935.
- U. S. Department of the Army. Office of the Surgeon General.
Report of the Surgeon General to the Secretary of War, 1937.
Washington: Government Printing Office, 1937
- Zuziak, Paul. "Military Veterinarians Key Public Health Role in
Operation Desert Shield." Journal of the American Veterinary
Medical Association, Vol. 197, No. 10, 15 November 1990, pp.
1265-1267.