

1986

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Recommended Citation

Emerson, Ann P. (1986) "Standards of Nutrition in a St. Augustine Hospital, 1783-1821," *Florida Historical Quarterly*: Vol. 65 : No. 2 , Article 3.

Available at: <https://stars.library.ucf.edu/fhq/vol65/iss2/3>

STANDARDS OF NUTRITION IN A ST. AUGUSTINE HOSPITAL, 1783- 1821

by ANN P. EMERSON

ESTABLISHED by royal decree of the king of Spain in 1776, the Regulations for Royal Hospitals provided guidelines for hospital care in royal Spanish hospitals. This included the one in St. Augustine, Florida, during the Second Spanish Period (1783-1821).¹ Other Spanish hospitals at this time were located in Mobile and New Orleans.² The set of regulations is among the earliest written documents specifying the role and responsibilities of medical personnel, treatment of patients, content of regular and special diets, and preparation of food for patients.³ Earlier, in 1570, Phillip II of Spain had established a law to provide his subjects with physicians, and laws passed in 1621 and 1648 declared that physicians must have a degree and a license.⁴ The 1776 regulations specify standard diets to be provided to the patient.

The hospital in St. Augustine was governed by the regulations, and though the site of the hospital may have changed through the years, the rules governing its operation did not.⁵ The regulations state the duties and responsibilities of the administrative and medical staffs and specify in detail the types of diets to be served. It is not known whether the regulations were precisely practiced in the St. Augustine hospital, but the diets provide a standard for diet and nutrition for that day and age.

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1. Papers of the Comptrollers of the Royal Hospital, Regulations for Royal Hospitals, August 22, 1776, Reel 31, Bundle 83E7, document 1776-1, East Florida Papers, Library of Congress, Manuscript Division, microfilm copies in P. K. Yonge Library of Florida History, University of Florida, Gainesville (hereinafter cited as EFP with appropriate reel and bundle number.)
2. Jack D. L. Holmes, "Spanish Medical Care in the Mobile District: advanced or retarded?" *Journal of the Florida Medical Association* 71 (July 1984), 463-68.
3. Abraham P. Nasatir, "Royal Hospitals in Colonial Spanish America," *Annals of Medical History* 4 (November 1942), 481-503.
4. *Recopilacion de leyes de los reinos de la Indias*, 4 vols. (Madrid: Boix, 1841), Libro V. Titulo VI, leyes 1 and 4.
5. The hospital may have been located on as many as three different sites in St. Augustine during the Second Spanish Period.

Information gained from shipping manifests of vessels provisioning St. Augustine from Havana indicate that many foods specified in the diets were ordered and sent to the hospital.⁶ By comparing the expected food intake as specified by the regulations with current Recommended Dietary Allowances (RDA), one can make an educated guess as to the adequacy of the standard eighteenth-century hospital diets in Florida.⁷

Before evaluating the nutrition component of hospital care during the Second Spanish Period, it is desirable to look at the entire structure of the hospital and to examine the type of medical care provided to patients. The hospital served the populace of St. Augustine and the surrounding area, as well as its troops, and was supported financially by the royal treasury. The military personnel were charged based on their rank and civilians on their ability to pay. The poor and slaves received treatment paid for from charity funds. The number of patients fluctuated greatly, from forty to four or fewer.⁸ The administrative structure as defined in the regulations indicates that a comptroller or hospital director was responsible for all aspects of care. He was assisted by a receiving clerk and a steward.⁹ The physician and the surgeon headed the medical staff. In the administrative structure the physician seems to have outranked the surgeon, if wages can be considered a criterion of rank. In at least one instance where salary was indicated (June 1, 1784), the physician was paid fifty pesos per month, with subsistence aboard ship, and two rations ashore, the surgeon received forty-five pesos per month with the same fringe benefits, and the hospital comptroller received thirty-five pesos per month also with the same fringe benefits.¹⁰

The activities of the physician and surgeon, the practitioners (residents, and interns), apothecaries, orderlies, and nurses have been described in contemporary records. The responsibilities of the doctors and staff included twice-daily visits to the patients and dictating, recording, and signing orders, emergency treat-

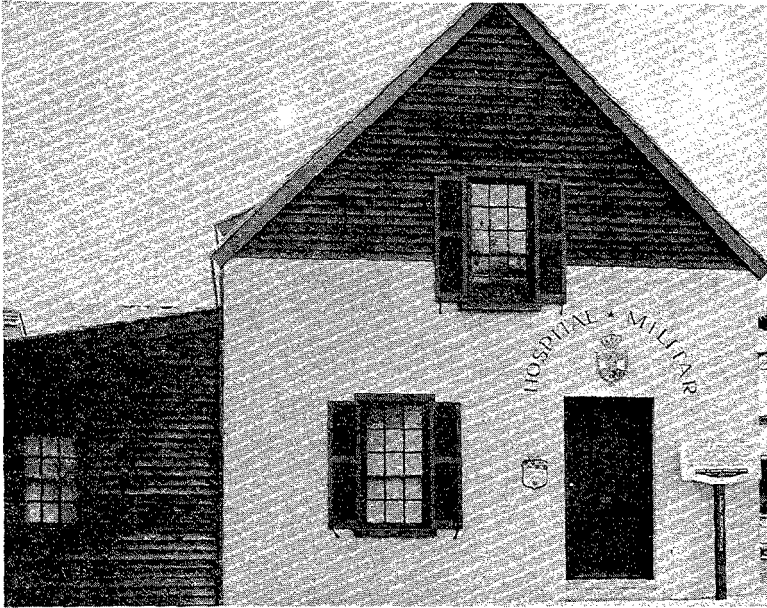
6. Archivo General de Indias. Santo Domingo, Legajo 2643, Expediente, June 15, 1790, 173p.

7. National Academy of Sciences, Food and Nutrition Board, *Recommended Dietary Allowances* (Washington, D.C., 1980), 186.

8. Robert F. Crider, "The Borderland Floridas, 1815-1821: Spanish Sovereignty Under Siege" (Ph.D. dissertation, Florida State University, 1979), 140.

9. Nasatir, "Royal Hospitals," 483-86.

10. Joseph B. Lockey, *East Florida, 1783-1785* (Berkeley, 1949), 198.



Twentieth-century replica of the Spanish Military Hospital in St. Augustine.
Photograph courtesy of the Historic St. Augustine Preservation Board.

ment of patients, preparation of medications, record-keeping to assure the patient received the ordered treatment, and general supervision of patient care. The wardrobe keeper saw to the clothing of patients and the cleanliness of sheets, mattresses, blankets, pillow cases, and surgical bandages. A chaplain was also assigned to the hospital.¹¹

The orderly was responsible for rations distributed to patients, and he checked his written memorandum (recorded when the physician and surgeon made rounds) to make sure each patient received the ordered diet. The orderly determined that no one introduced anything not prescribed to eat or drink since it might harm the patient. If he suspected that patients had raw brandy, wine, chili, or other food in their rooms, or traded rations, he was to inform the director. He inspected the "chocolate maker" and other vessels if they were copper to make

11. William M. Straight, "Life in the Spanish Colonial Hospitals in the Late 18th Century," *Journal of the Florida Medical Association* 55 (August 1968), 765-69.

sure "they are well tinned" lest they "cause fatal consequences with their verdigris."¹²

The steward supervised the kitchen. The orderly saw to the serving of the trays on the wards, and a cook and a baker were employed to prepare the food in the kitchen. According to a list of St. Augustine hospital employees dated June 1, 1784, the cook was paid eighteen pesos per month and the baker twenty pesos. Other employees on the list may have helped with some kitchen activities such as preparing food for cooking or washing dishes. Presumably all employees were male; no female names appear on the lists of personnel.¹³

Several surviving descriptions of kitchens indicate that they were usually detached from the main building or were at least a separate room. One description of the Hospital and Apothecary's Shop de la Cruz, 1821, indicates that one room was used as the kitchen. It "had a fireplace with a chimney, two small ovens with proper irons for the laboratory of the shop and baking."¹⁴ Irons may indicate cooking utensils such as pots and baking utensils.¹⁵ An appraisal of the royal hospital in December 1763, at the end of the First Spanish Period, stated that the framework of the kitchen, boards, and roofing shingles were worth 350 pesos.¹⁶ On December 31, 1791, the kitchen of the hospital was described as being adjacent to the pantry with a high chimney, a table, a "parador" of wood, shutter door and shutter windows, and iron work.¹⁷ The usual house kitchen during the Second Spanish Period has been described as having a stove with a chimney. Depending upon the size of the family, the stove may have had three or more openings in the top (with covers). The size of the openings was appropriate for the dimensions of the earthenware pots, which seemed to fit directly over the hole. Ovens were sometimes built into the chimneys. "The 1788 map shows many small outbuildings which can be nothing but kitchens." Later tax appraisals indicate that kitchens were built of masonry or timber frame and that they had chimneys. "The kitchen of the Customs House (1787) was most likely one

12. Nasatir, "Royal Hospitals," 495.

13. Lockey, *East Florida*, 199.

14. File, "Hospital and Apothecary's Shop de la Cruz," St. Augustine Historical Society Library, St. Augustine, Florida.

15. Reay Tannahill, *Food in History* (New York, 1973), 108.

16. File, "Appraisal of Royal Hospital of St. Augustine, Florida," St. Augustine Historical Society Library.

17. File, "Old Burnt Hospital," St. Augustine Historical Society Library.

of the better ones. It was a twelve by fifteen foot room with two doors and three windows, tacked onto one of the wings of the building. An oven and a brick stove, its 'three burner' top about twenty-eight by forty-eight inches flanked the fireplace.¹⁸ In some kitchens the fireplace was "raised with stone two foot high and three broad," and it ran the "length of the breadth of the room," and the hearth had several holes in it over which were placed pots in which to boil their "different" soups.¹⁹ There is no plan of what the hospital kitchen contained, but there is evidence that a baker and a cook were on the staff.²⁰

Supplies for most of the hospital diets were probably obtained from locally produced foodstuffs, but some were from imported sources. Letters from the period indicate that in 1786 fresh meat for the hospital was lacking.²¹ In 1794, in a letter to Governor Juan Nepomuceno de Quesada, Carlos Howard, director of the hospital, commented on the lack of chickens for the convalescents and stated that it was necessary to have chicken soup for people who were ill.²² In 1816, there was a problem of fresh meat ration and a shortage of salt.²³ Supplies for the hospital were let by contract. In 1807, a contract was made to provide chickens, milk, and eggs for the hospital.²⁴ In 1811, bids were let for the supply of chickens for the hospital.²⁵

Spanish colonials brought with them from Spain the practice of combining foods into *olla podrida*, a stew of innumerable combinations of meat and vegetables cooked together in an earthenware vessel. Meats commonly used in Spain were sheep, hares, hens, geese, and game birds. They were combined with such vegetables as carrots, potatoes, peas, and onions, -and cooked together in a large stew pot for many hours. Other methods of

18. Albert C. Manucy, *The Houses of St. Augustine; Notes on the Architecture from 1565-1821* (St. Augustine, 1962; reprint edition, Tallahassee, 1978), 124.
19. John Bartram, *Diary of a Journey Through the Carolinas, Georgia, and Florida from July 1, 1765 to April 10, 1776* (Philadelphia, 1942), 55.
20. Lockey, *East Florida*, 199.
21. Juan Manuel Serantes to Governor, February 28, 1786, reel number 31, bundle 83E7, document 1786-2, EFP.
22. Carlos Howard to Juan Nepomuceno de Quesada, October 3, 1794, reel number 51, bundle 127J10, document 1794-883, EFP.
23. Juan Jose Robles to Governor, August 16, 1816, reel number 62, bundle 150G12, document 1816-133, EFP.
24. Correspondents unknown, June 6, 1807, reel number 118, bundle 278013, document 1807-5, EFP.
25. Governor of Florida to Manuel Romero, January 29, 1811, reel number 60, bundle 147D12, document 1811-41, EFP.

cooking were roasting, frying (eggs, bacon, sausages), boiling (vegetables, milk, fish), baking (bread and pies), and broiling (chicken and beef). The method of cooking stew in a pot was transferred from Spain to the Americas where it was very similar to the aboriginal methods. Here other types of vegetables—cassava, yucca, sweet potato, peanuts, arrowroot, maize, beans, peppers, and squash—were added to the stews. The kind of meat used in the stews changed with the new habitat. Cattle became an important resource; sheep did not. The use of wild food (deer, gopher) more closely resembled the aboriginal culture.²⁶ As indicated in the regulations, other items that may have been used in the St. Augustine hospital were bacon, eggs, chicken, pigeon, beef, meat balls, and hash.²⁷

The primary cooking utensil was the earthenware cooking pot. Olive jars were used for storing oil, wine, and olives. Indicative of the importance of stews is that in archeological digs in St. Augustine, San Marcos (local) aboriginal pottery vessels or Spanish earthenware cooking implements were the most commonly found from the seventeenth and eighteenth centuries.²⁸ Soups were cooked in an earthenware pot placed over the open hole of a stove. Breads, meats, and meat pies were baked in the oven, and may have been roasted on a spit in the fireplace or over a burner in the stove. Wood was probably the source of fuel. Correspondence between the governor's office and a local citizen in 1798 indicates that the firewood contract for the supply of wood had been let.²⁹ In the late eighteenth and early nineteenth centuries, similar cooking methods were probably used in the hospital kitchen. The directions for food preparation given in the regulations indicate boiling soup and roasting meats were methods of cooking.³⁰

The Regulations for Royal Hospitals specify in detail eighteen regular diets and thirteen special diets or special diet items to be prepared for hospital patients. Some of the diets seem to have been "ordinary," or by today's standards, regular diets. The diets may have been different types of menus served as

26. Stephen L. Cumbaa, "Patterns of Resource Use and Cross-Cultural Dietary Change in the Spanish Colonial Period" (Ph.D. dissertation, University of Florida, 1975), 195.
27. Nasatir, "Royal Hospitals," 498-501.
28. Cumbaa, "Patterns of Resource Use," 175.
29. Proceedings on firewood contract, December 13, 1798, reel number 118, bundle 279012, document 1798-5, EFP.
30. Nasatir, "Royal Hospitals," 498-501.

regular or ordinary diets from time to time for variety. The diets in this category are the ordinary ration, hen ration, chicken ration, ration of young pigeon, ration of roast beef, ration of roast chicken, ration of roast young pigeon, ration of meat balls, and the hash ration. The menu would have varied depending on food-stuffs available in East Florida. Whether the diets were offered on a daily or weekly basis is not known.

Directions for cooking the diets indicate that the ingredients were to be made into a soup for each meal. Specific amounts were to be served to each patient. The first diet listed— the ordinary ration— was made up of a pound of fresh beef (with bone), one ounce of bacon, one ounce of chickpeas (garbanzo beans), fourteen ounces of bread, and one-half ounce of pork lard. This allowance of food was the amount for one day, and it was further divided into meal plans with a specific number of ounces of each item to be served at each meal and given to the designated patient. The meat, bacon, chickpeas, and lard seem to have been prepared in the same cookpot and served with the bread, either separately or in the soup. Directions for the early morning meal state “with two ounces of bread and one-half ounce of lard the soup for breakfast is made.”³¹

No mention is made of vegetables such as onion, garlic, greens, potatoes, tomatoes, and peppers being cooked in the soup. However, a knowledge of cooking methods in St. Augustine at that time indicates that such vegetables probably were added.³² It is known that growing in household gardens, and probably in fields surrounding St. Augustine, were such vegetables as rice, peas, onions, garlic, greens, lettuce, radishes, plantains, sweet potatoes, tomatoes, peppers, corn, squash and pumpkins. Fruits cultivated in St. Augustine included figs, pomegranates, lemons, limes, citrons, plums, peaches, cherries, quinces, and grapes.³³ Neither fruits nor vegetables are mentioned in the regulations.³⁴

The second diet, a ration and a half, provided the patient with a regular ration at the noon meal and a half ration (or light meal) for the evening meal. Again, it is likely that these ingre-

31. *Ibid.*, 498.

32. Cumbaa, “Patterns of Resource Use,” 115-17.

33. Bruce S. Chappell, *A Report on Documentation Relating to the History of the Diego Plains Region in Second Spanish Period Florida (1784-1821)* (Gainesville, 1976), 4.

34. Nasatir, “Royal Hospitals,” 481-503.

NUTRITIONAL ANALYSIS OF GENERAL DIETS AVAILABLE TO PATIENTS IN ST. AUGUSTINE HOSPITAL DURING 1783-1821

ration	kcal	pro	fat	CHO	Ca	P	Fe	VitA	Thia	Ribo	Niac	Chol	Fol	Vit.E	zinc
		gm	gm			mg		IU		mg			µg	IU	mg
1. ordinary	2939	115	168	230	444	1176	15.8	267	0.785	1.086	22.56	371	251	9.6	20.9
2. one and 1/2	2576	99	150	200	387	1027	14.0	231	0.705	0.942	19.50	321	223	8.71	17.8
3. half	1864	70	112	139	275	728	10.2	159	0.537	0.654	13.38	222	169	6.7	11.0
4. hen	3005	130	169	230	450	1340	12.1	5199	0.783	1.368	45.12	396	263	9.4	9.4
5. half hen	1804	72	105	139	275	764	7.6	2607	0.513	0.750	23.46	210	172	6.5	5.2
6. egg	1593	63	51	214	461	817	7.5	2360	0.514	0.378	4.62	15	294	5.2	4.5
7. soup	1267	37	28	212	353	407	2.9	-	0.294	0.978	4.82	459	164	7.2	2.5
8. half soup	781	21	23	121	202	233	1.7	-	0.168	0.216	2.64	15	94	3.1	1.4
9. soup (eggs)	1269	52	48	154	360	701	6.7	2360	0.43	0.87	3.5	459	247	5.6	3.8
10. chicken	2389	163	81	230	478	1804	17.3	4614	0.936	2.846	41.04	512	276	9.9	11.2
11. young pigeon	1821	85	60	230	427	960	9.4	1548	0.642	1.254	17.52	187	240	8.5	5.9
12. rice	2138	53	29	405	411	633	4.8	-	0.462	0.45	8.46	15	174	5.4	3.8
13. vermicelli	2153	67	31	393	418	79	6.0	-	0.51	0.522	8.72	-	193	8.1	6.1
14. roast beef	3090	116	192	212	401	1137	14.9	288	0.630	1.098	23.82	441	198	7.7	22.8
15. roast chicken	2354	154	89	212	429	1673	14.9	4599	0.735	2.768	39.9	533	218	7.7	10.5
16. roast pigeon	1800	76	68	212	378	829	6.9	1533	0.441	1.176	16.38	208	182	6.3	5.2
17. meatballs	2793	112	162	213	447	1191	14.6	1396	0.764	1.251	19.66	543	254	9.6	18.6
18. hash	2793	112	162	213	447	1191	14.6	1396	0.764	1.251	19.66	543	254	9.6	18.6
RDA [†]		56			800	800	10.0	1000	1.4	1.6	18.0		400	10.0	15.0

[†]Recommended Dietary Allowances, male twenty-three to fifty years of age, Food and Nutrition Board, National Academy of Sciences.

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NUTRITIONAL ANALYSIS OF SPECIAL DIETS AVAILABLE TO PATIENTS IN ST. AUGUSTINE HOSPITAL DURING 1783-1821

ration	kcal	<u>pro</u>	<u>fat</u>	<u>CHO</u>	<u>Ca</u>	<u>P</u>	<u>Fe</u>	<u>VitA</u>	<u>Thia</u>	<u>Ribo</u>	<u>Niac</u>	<u>Chol</u>	<u>Fol</u>	<u>VitE</u>	<u>zinc</u>
		gm	gm	mg	mg	mg	IU	mg	mg	mg	kg	IU	mg		
19. diet	1992	101	166	18	103	988	13.4	2787	0.555	0.984	32.82	443	99	4.7	16.4
20. ordinary	1970	103	148	50	117	1023	13.7	3057	0.477	1.691	32.4	461	103	3.0	16.4
21. rigorous	2512	136	206	20	217	1489	19.5	5183	0.817	1.674	35.42	936	233	7.1	20.9
22. wine	306	—	—	15	32	36	1.4	—	—	0.036	0.36	—	—	—	—
23. halfwine	153	—	—	8	16	18	0.7	—	—	0.018	0.18	—	—	—	—
24. chocolate	314	8	18	39	73	173	2.4	18	0.044	0.061	1.11	—	23	2.5	2.1
25. broth+															
26. toast	235	5	2	41	55	64	0.6	—	0.042	0.060	0.72	—	23	0.7	0.4
27. extraordinary	140	2	2	19	14	40	0.6	135	0.015	0.048	0.12	14	2	—	—
28. for stomach	375	10	4	64	106	122	1.0	—	0.84	0.114	1.38	—	47	1.4	0.7
29. milk - 1 pint	316	17	18	24	561	442	—	720	0.144	0.816	0.48	130	24	1.7	1.9
29. milk - 2 pints	632	34	36	47	1258	883	—	1440	0.288	1.632	0.96	260	48	3.4	3.8
30. wheat gruel	1460	25	47	228	38	208	1.9	—	0.144	0.12	2.16	45	60	6.6	1.8
31. rice gruel	1041	11	—	243	16	173	9.7	—	0.749	0.202	10.37	—	1	0.2	2.3
RDA†		56			800	800	10.0	1000	1.4	1.6	18.0		400	10.0	15.0

†No. 25 - broth - not analyzed.

‡Recommended Dietary Allowances, male twenty-three to fifty years of age. Food and Nutrition Board, National Academy of Sciences.

dients were made into a soup because directions specify “in the breakfast soup” and “in the dinner (soup).” The half ration of beef and half ration of hen provided a light, or half ration at noon and for the evening meal. The food components for these meals are the same as the ordinary ration for beef and hen, but the amount served was different or reduced by about half. The hen ration was composed of two parts of a hen with bacon, chickpeas, bread, and lard. A hen was considered to have five parts-four of the body and one of giblets, neck, wings and legs. This diet used only two of the five parts of a hen. The egg ration was composed only of eggs, bread, and lard, but directions stipulated that it was to be served with a cup of broth from the “common pot,” one for dinner and another at supper.³⁵ It is difficult to determine how the eggs were incorporated into the diet. They could have been beaten and dropped in the soup or served as scrambled, softboiled, hardboiled, poached, or fried. The seventh diet was a soup ration which provided bread and lard with a “sufficient” portion from the common pot for dinner and an equal portion for supper. The next listed was a half ration of soup, which reduced the amount of bread that the patient was to receive. This diet also specified that “broth from the corresponding pot in the dinner” and “sufficient broth in the supper” be served.³⁶ This wording may indicate that soup contained more solids than broth and that when broth was served the solids were removed from the soup, indicating more of a diet restriction.

In the soup ration with eggs, it is specified that “broth from the pot which is necessary to fry them” be allotted in addition to the soup to be used as part of the diet. The chicken ration provided for a whole chicken, half in the noon and the other half in the evening soup; in ration of young pigeon, one pigeon for the day was specified, and it was to be evenly divided between lunch and supper. The rice ration and the vermicelli ration were each cooked in broth from the pot. Thus, they may have had a beef or chicken flavor, depending upon the pot or broth source.

The roast beef diet, which consisted of fresh beef, bread, and lard, contained more lard than other diets; one-half ounce was used at breakfast and another ounce was divided between

35. *Ibid.*, 499.

36. *Ibid.*

dinner and supper for basting the beef to be roasted. Directions state that the beef was to be cooked in the soup pot, removed when half done, greased with an allowance of lard and then roasted. This method of moist cookery (in the pot) would tenderize the meat before roasting. Roasting after basting with fat would give the meat a different flavor and texture. Patients served this ration were also given a cup of broth from the pot at dinner and another at supper. Ration of roast chicken also provided an extra ounce of lard, half to be added at dinner and half to be added at supper, for basting the chicken as it roasted. The chicken was put in the pot to "cook a little" and was later taken out for roasting. Ration of roast young pigeon consisted of one pigeon, bread, and lard, plus a cup of soup at dinner and supper. The young pigeon was cooked and basted as was the chicken.

Ration of meatballs was composed of beef, bread, lard, bacon, and two eggs. It is not known how the meatballs were formed or cooked; however, the directions state "one egg for the meatballs" at noon and evening which may indicate that the meat and eggs were molded into balls. The regulations do not indicate that a cup of soup was served with this ration. The hash ration was also made up of beef and eggs, as well as bread, lard, and bacon. The preparation of this dish is also unknown, but the directions for the dinner meal specify "used in hash for dinner." Those for the supper state "hash for supper shall be made from" and then lists the ingredients.³⁷

Diet rations and special diet items that were the total diet or could be added to the diets are also included in the regulations. The diet ration was a list of ingredients that were to be converted into a "nutriment," one cup of which was to be served every four hours. The nutriment must have been a thick soup because it contained beef and chicken as well as chickpeas and bacon. Ingredients may have been chopped or minced before cooking and were probably cooked long enough to become the consistency of a puree. Again, vegetables may have been added to this nutriment to be served to the patients "according to what is agreeable to him and to what the physician or head surgeon orders." The ordinary diet ration also provided for a nutriment with slightly different ingredients. Half were to be made into a nutriment of three cups and given to a patient every four hours

37. *Ibid.*, 501.

over a twelve-hour period. The remaining ingredients were combined and made into a nutriment for the following twelve hours. The rigorous diet was similar to the ordinary diet except that it contained an additional four eggs. The cooking and distribution were similar, in that a nutriment was to be given to the patient every four hours.

The wine ration and the half wine ration provided for a daily ration of twelve ounces and six ounces of wine, respectively, to be divided evenly and given with the noon and evening meals. The directions state that "they shall not be given without an express order from the physician or head surgeon." The chocolate ration could be provided at breakfast when the physician ordered it. It consisted of chocolate and bread or sponge cake. It was to be drunk for breakfast, and the patient was not to receive "any other." Utensils for preparing chocolate were usually kept on the patient ward.³⁸

When patients had been given a "physic," a special diet was prescribed stipulating that no breakfast was to be taken other than a cup of broth made from chicken two hours after the "physic" was taken. Toast for breakfast, another special diet, consisted of bread, wine, sugar, and a pinch of cinnamon and was all that the patient could have for that meal. The food for dinner and supper were not prescribed. This may have been a special breakfast to be followed by any other diet for the remaining two meals. Two special preparations contained wine and were only to be given upon special order of the physician or surgeon. These diets were classified as extraordinary regimen and regimen for the stomach. The former was composed of wine and sponge cake; the latter was bread and wine with a pinch of cinnamon. These concoctions may have been prescribed for nausea or an upset stomach. The milk ration consisted of a plain ration (one pint) and a double ration (two pints), and were ordered when a patient had a sore mouth.

Wheat flour gruel made of wheat flour, lard, and sugar could be served for breakfast, dinner, and supper; specific directions for mixing ingredients for each meal were given. The gruel seems to have been prepared fresh for each meal. The rice flour gruel was similar to the wheat flour gruel and was prepared by adding sufficient broth from the diet to prepare the rice; sugar was then added to it. This food item seems to be

38. *Ibid.*

an adjunct to another diet for the directions specify that two ounces of the gruel be given at each meal but that the patient "should not fail to enjoy the rest of the food which the physician should authorize as advantageous." Evidently the rice gruel had a reputation for soothing. The regulations state "its qualities of cooling and nutritive, sweetener of the bitterness of the humors . . . is more appropos than another for the betterment of the patients." Spices to serve as condiments to the food were specified to be saffron, cinnamon, and common salt unless the physician should order others.³⁹ Other regulations specified that a ration of six ounces of salt per month was to be allowed for each person. Salt, of course, was an important substance for preserving food.⁴⁰ It is assumed that the diets were high in salt content, although the amount for each daily ration is not mentioned in the regulations. A final statement regarding food indicates that the physician or surgeon could vary the food or amount of food whenever he considered it necessary for the care of the patient.

An analysis of the eighteen regular diets indicates that they were generally high in calories, protein, fat, iron, cholesterol, and saturated fat.⁴¹ In these nutrients they more than meet the current RDA, based on the requirements of a man between twenty-three and fifty years of age.⁴² This figure is used because most of the residents of St. Augustine at the time were soldiers (male) in the Spanish army and were probably between these ages. Analysis of these diets probably represents a minimal number of calories and nutrients, since other nutrients that were possibly in the diet are not included in the figures reported.

An analysis of the thirteen special diets and diet items was also performed. Some of the special diets were similar to the regular diets in content, but the consistency of the nutriment was different. A number of the special diet items cannot be considered as complete rations, because they were special breakfasts, special treatments for particular conditions, or special items to be added to another diet.

The caloric levels of many of the diets were fairly high. Five of the diets (ordinary, hen, roast beef, meatballs, and hash) pro-

39. *Ibid.*, 502.

40. Governor of Florida to Joseph Truxillo, September 3, 1788, reel number 45, bundle 119B10, document 1788-251, EFP.

41. Detailed information on analysis of diets in possession of the author.

42. *Recommended Dietary Allowances*, 186.

vided between 2,800 and 3,000 kcal per day. The ration and a half diet provided about 2,500 kcal per day, and the half ration diets (half and half of hen), as well as young pigeon and roast pigeon provided around 1,800 kcal per day each. The egg ration diet provided 1,600 kcal. Two diets (chicken and roast chicken) provided around 2,400 kcal per day. The soup ration and half ration of soup provided about 1,200 kcal and 800 kcal, respectively, and the soup ration with eggs was about 1,300 kcal. The rice and vermicelli diets provided more than 2,100 kcal per day. Thus, except for the half soup ration, all of these diets provided more than 1,200 kcal per day.

The caloric values of the nutriments were approximately 2,000 kcal per day for diet and ordinary, and 2,500 kcal per day for the rigorous diet. This is an adequate number of calories for a man weighing 70 kg. The wine rations added pleasure and a few calories, 300 and 150, respectively, but added few other nutrients to the diets. The chocolate ration as a special breakfast added 315 kcal if bread was used and 240 kcal if sponge cake was used. The toast breakfast provided about 200 kcal for the nutrients provided. The extraordinary regimen and the regimen for the stomach, probably only used for a short period of time, provided only 140 kcal and 375 kcal for each diet. When milk was added to the diet, an additional 316 kcal was added for each pint. Wheat flour gruel provided more than 1,400 kcal for a twenty-four hour period, and rice gruel added 1,000 kcal to a diet.

The amount of protein provided in most of the diets (except for the soup ration, the half soup ration, soup with eggs, and rice ration) had more than the RDA for a healthy man between twenty-three and fifty years of age. The protein was primarily of high biologic value because eggs, beef, and poultry were the primary sources. The fat content of most of the diets was high; the fat was animal fat and therefore was saturated. The cholesterol content of most of the diets was high. An adequate amount of carbohydrates was provided for energy primarily in the form of bread and chickpeas. The three nutriments were all very low in carbohydrate content but high in protein and fat.

The amount of vitamin A was low in some of the calculated diets because of the lack of vegetables containing provitamin A. However, all of the diets containing eggs, hen, chicken, or pigeon had adequate amounts of vitamin A. If, as is suspected, vegetables were added to the soup, the vitamin A content of all

diets could well have been adequate because sweet potatoes, tomatoes, corn, and squash were successfully grown in St. Augustine.⁴³ Vitamin D should not have been a problem since St. Augustine is sunny year round. The amount of vitamin E was slightly low in most of the diets.

Because whole grain cereals were not included in the diets, the thiamin content of all of them was low. Garbanzo beans contributed to the thiamin content of the diets, but polished rice and the unenriched bread provided a minimal amount. The bread was made from imported wheat flour shipped to St. Augustine. Whole grain flour did not keep as well as white; therefore, it was not shipped long distances. Because wheat did not grow well in Florida, whole wheat bread was not available.

The riboflavin content of most of the diets was low because they lacked milk, other milk products, and green leafy vegetables. The special diet that added milk to the diet did provide an adequate amount of riboflavin, as did several of the diets containing a good deal of chicken. Depending on the possible use of vegetables in the soup, the riboflavin content in the diets may have been higher. The niacin content of those diets containing an adequate amount of meat and poultry was high. However, there was little niacin in some of the diets-half ration, egg ration, soup ration, half soup ration, soup with eggs, rice, and vermicelli.

The folacin content of all of the diets was low. Although some folacin occurs in poultry, meat, and legumes, the lack of vegetables in the diet caused the total to be inadequate. Green vegetables or tomatoes in the soup and the use of orange juice would have increased the folacin content of the diets.

Ascorbic acid levels in the diets were extremely low and were not included in the analysis. During the winter, if oranges, or orange, lemon, or lime juice were used, all of which were available in St. Augustine, the diets may have been adequate. During seasons when other fresh vegetables and fruits were plentiful, melons, potatoes, tomatoes, squash, sweet potatoes, and green beans would have added ascorbic acid to the diets.

The calcium levels were low in all of the diets except in the diet which provided milk. Collard greens, spinach, oranges, or green beans would have added small amounts of calcium to the diet, but probably not enough to meet the RDA. Custards or

43. Chappell, *Report on Documentation*, 4.

puddings would have increased the calcium content, but they are not mentioned in the regulations. Phosphorus levels in the diets were more than adequate, reflecting the high protein foods—meat, chicken, eggs—which are good sources of phosphorus.

Most of the diets high in meat or poultry contained adequate iron. The half ration diets and the soup, egg, rice, vermicelli, and pigeon diets were low in iron content. Iron cooking utensils and iron in the water may have contributed to the levels in the diet. The zinc content of the diets containing high protein foods, such as meats, poultry, and eggs, was high. The soup, half ration, rice, vermicelli, and pigeon rations were low. All of the nutriment were high in iron and zinc. Peanuts, potatoes, and milk products would have added zinc content. Oysters are a rich source of zinc, but may or may not have been used in the diets of those ill in Florida.

The sodium content of the diets was probably high. It is impossible to establish an average figure because there is no indication how much salt was used for seasoning, and salted meats may have been used frequently instead of fresh.

Whether or not these diets were available at all times is not known. However, the fact that such diets were planned and included in the written regulations shows that the medical science of that time provided a standard of nutritional care for hospital patients. Many of the items specified in the diets may not have been available from time to time, and many substitutions may have been made.

The beef used in St. Augustine could have been fresh beef slaughtered in the city which had a city slaughter house and private butcher shops. Salted meats, cut in manageable portions and packed in barrels, came into the city from Charleston, Savannah, and Havana.⁴⁴ The beef cattle slaughtered locally were probably range cattle with a composition of flesh comparable to a contemporary grade of “good” beef. The bacon was from pigs slaughtered locally or could have been shipped. The figures used in the calculations for chickpeas (garbanzo beans) are for mature, raw, dry seeds which could have been grown in St. Augustine or imported. The bread would have been white, unenriched bread. Although bread is mentioned in the diets, it is possible that in the St. Augustine area, corn may have fre-

44. Cumbaa, “Patterns of Resource Use,” 122.

quently been substituted for wheat in making bread. In this area of Florida two crops of corn were grown each year, and it was a staple in the diet.⁴⁵ Hens were raised locally and used for food after they had ceased to lay eggs. They were probably raised in St. Augustine or in the surrounding area. White leghorn hens, the most common poultry raised in Florida at that time, are estimated to have weighed an average of four pounds each.⁴⁶ Chickens were raised and sold to the Spanish government under contract.⁴⁷ They were probably raised in the open; one chicken is estimated to have weighed two pounds. The young pigeons are assumed to have been passenger pigeons. If they were wild (trapped or shot), they probably weighed nine to twelve ounces and approximately fifty per cent of the carcass would have been edible. Pigeons may have been raised domestically, in which case their weight would have ranged from ten ounces to one pound with fifty per cent of the weight being edible meat. The passenger pigeon has been extinct since around 1900, so the composition of the carcass is an estimate. The mourning dove is probably the most similar existing bird. However, since composition figures of the dove were not available, the figures for chicken were used.⁴⁸

Eggs were produced in St. Augustine and were sold to the government under contract.⁴⁹ Rice was grown locally and was also imported. The sponge cake used in the diet was noted in the Spanish version as "panetela" and may have been a sweet bread or a breakfast bread such as a roll or muffin. Most wine was imported, but since grapes grew plentifully in St. Augustine and most homes had their own grapevines on arbors, it may have been a local product.⁵⁰ Chocolate was imported and was an important drink for the citizens of St. Augustine. Milk was produced locally because without refrigeration it would have been too difficult to ship.

The most prominent fruit in St. Augustine was the orange. Brought from Spain by early explorers and settlers, it was

45. *Ibid.*, 82.

46. Information furnished by Dr. Mary Clench, J. Hillis Miller Health Center, University of Florida, Gainesville.

47. Governor of Florida to Manuel Romero, January 29, 1811, reel number 60, bundle 147D12, document 1811-41. EFP.

48. Information furnished by Dr. Mary Clench.

49. Correspondents unknown, June 6, 1807, reel number 118, bundle 278013, document 1807-5. EFP.

50. Chappell, *Report on Documentation*, 4.

quickly established in Florida because it grew so easily. From time to time, a freeze destroyed most of the groves or trees, but usually they came back from the roots and in a few years were bearing fruit again. By the 1760s oranges were being shipped from St. Augustine to Charleston and New York. Beef, salt, flour, herring, cheese, butter, rum, brandy, corn, peas, tallow, and beer were shipped into St. Augustine.⁵¹ Other fruits, such as grapes, lemons, limes, plums, figs, and peaches, grew in the area. Although these fruits are not mentioned in the regulations, they were available to the population and probably freely eaten. Since oranges are ripe and available in the winter, they would have provided a good source of vitamin C when other vegetables and fruits were not as plentiful.

In St. Augustine, seafood was a major item in the diet although the hospital regulations do not mention seafood. It may have been used as a hospital diet, or it may have been considered inappropriate for the ill. Oysters and clams were consumed by the general public in great quantities. Fish such as mullet, red-fish, drum, and flounder were commonly eaten by the citizens.⁵²

Absent from the list of foods utilized are olive oil and butter, which were used extensively in early St. Augustine. Olive oil and butter may not have been considered desirable foods for an ill person. Pork lard seems to have been the preferred fat.⁵³

Hospital diets prescribed in the written Regulations for Royal Hospitals, and used in the royal hospital in St. Augustine provide us with some of the earliest written standards of nutrition care provided in the present day United States. This information preserved in Spanish records enables one to evaluate the quality of hospital diets planned for eighteenth-century patients based on the 1980 RDA. The impact of these standards on the diets of individuals in St. Augustine during this period can only be estimated, but they did provide a guideline for nutritional intake. The most important consideration is that these standards were established.

51. Cumbaa, "Patterns of Resource Use," 122.

52. *Ibid.*, 50.

53. Nasatir, "Royal Hospitals," 498-500.