

Food of the Apollo 11 Lunar Landing

July 16, 2009, 12:00 pm 11 Comments



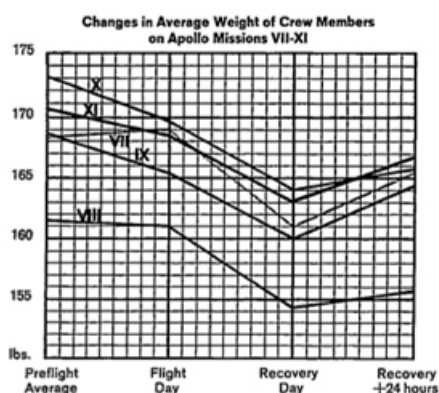
Apollo rehydratable food packaging. Via lsda.jsc.nasa.gov

The Apollo 11 flight is remembered as a giant leap for mankind, a moment when the world came together to watch Buzz Aldrin and Neil Armstrong hop, skip, and jump across the lunar surface. But the glamour and excitement of the moon landing overshadowed the more menial aspects of the eight-day flight mission surrounded it, days filled with NASA-mandated rest periods, science experiments, and, of course, eating. The food aboard Apollo 11 represented the height of late 1960s technology, as much as the Lunar Landing Module or the spacesuits worn on moonwalks. Tubes of apple sauce and stew were ditched for meals that could be heated by the astronauts and eaten with real silverware.

The Apollo crew even [dined](#) on thermo-stabilized cheddar cheese spread and hot dogs during the moon mission, bringing at least a bit of America in July to the sterile flight craft. And yes, there was bacon — foreshadowing the current bacon craze, the first meal eaten by man on the moon was none other than bacon cubes, coated with gelatin to combat crumbs.

Apollo 11 food had to satisfy some major requirements we never have to worry about here on Earth. Pre-flight body weight had to be maintained, something that had proved mysteriously difficult on previous missions. The graph, right from the [Autumn 1969 edition](#) (paid article) of the journal *Nutrition Today*, illustrates the dramatic weight loss suffered by Apollo astronauts.

After crunching the numbers back home, NASA revealed that Buzz Aldrin had expended 300 calories an hour on the moon, an amount akin to an hour of light yard work or running after the kids. Not



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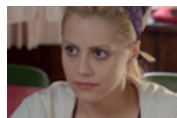
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Two grandmas, one waffle cone.

enough to worry about a severe weight loss, but add that amount to the stress and tension of being in space, and it's a small wonder that a main concern of dietary scientists was ensuring calorie-laden dinners.

Apollo 11 meal pack and menu



Figure 5. Apollo meal pack.

Apollo 11 meal pack. Photo via history.nasa.gov

Table 3
Typical Menu, Apollo 11-16

A. Command Module - CDR and CMP			
Day 1,* S	Day 2	Day 3	Day 4
Meal A			
Peaches (R) Bacon squares (S) (IMB) Strawberry cubes (4) (DB) Grape drink (R) Orange drink (R)	Fruit cocktail (R) Sausage parties (SBP) Cinnamon toast bread cubes (4) (DB) Cocoa (R) Grapefruit drink (R)	Peaches (R) Bacon squares (S) (IMB) Apricot cereal cubes (4) (DB) Grape drink (R) Orange drink (R)	Canadian bacon and applesauce (R) Sugar coated corn flakes (R) Peanut cubes (4) (DB) Cocoa (R) Orange-grapefruit drink (R)
Meal B			
Beef and potatoes (WP) Butterscotch pudding (R) Brownies (S) (IMB) Grape punch (R)	Frankfurters (WP) Applesauce (R) Chocolate pudding (R) Orange-grapefruit drink (R)	Cream of chicken soup (R) Turkey and gravy (WP) Cheese cracker cubes (S) (DB) Chocolate cubes (4) (DB) Pineapple-grapefruit drink (R)	Shrimp cocktail (R) Ham and potatoes (WP) Fruit cocktail (R) Date fruit cake (4) (IMB) Grapefruit drink (R)
Meal C			
Salmon salad (R) Chicken and rice (SBP) Sugar cookie cubes (4) (DB) Cocoa (R) Pineapple-grapefruit drink (R)	Spaghetti with meat sauce (SBP) Pork and scalloped potatoes (SBP) Pineapple fruit cake (4) (IMB) Grape punch (R)	Tuna salad (R) Chicken stew (SBP) Butterscotch pudding (R) Cocoa (R) Grapefruit drink (R)	Beef stew (WP) Coconut cubes (4) (DB) Banana pudding (R) Grape punch (R)

*Day 1 consisted of meals B and C only

**CMP substituted potato soup (R)

R = Rehydratable

I = Irradiated

DB = Dry bite

WP = Wet pack

IMB = Intermediate moisture bite

SBP = Spoon-bowl packet

Table 3 (Continued)
Typical Menu, Apollo 11-16

C. Lunar Module			
Meal A	Meal B		
Bacon squares (S) (IMB) Peaches (R) Sugar cookie cubes (S) (DB) Coffee (R) Pineapple-grapefruit drink (R)	Beef stew (R) Cream of chicken soup (R) Date fruit cake (4) (IMB) Grape punch (R) Orange drink (R)	Additional Items	
		Units	
Extra beverage (R)		8	
Dried fruit (IMB)		4	
Candy bar (IMB)		4	
Bread (I)		2	
Ham salad spread (tube food)		1	
Turkey and gravy (WP)		2	
D. Panty Stowage			
Accessories	Units	Breakfast	Units
Chewing gum	15	Peaches	6
Wet skin cleaning towels	30	Fruit cocktail	6
Oral hygiene kit	1	Canadian bacon and applesauce	3
3 toothbrushes		Bacon squares (S)	12
1 edible toothpaste		Sausage parties*	3
1 dental floss		Sugar coated corn flakes	6
Contingency feeding system	1	Strawberry cubes (4)	3
3 food restrainer pouches		Cinnamon toast bread cubes (4)	6
3 beverage packages		Apricot cereal cubes (4)	3
1 valve adapter (point-to)		Peanut cubes (4)	3
Spoons	3		
Germinol tablets (20)	3		
Total Units	53	Total Units	51
Rehydratable Desserts		Units	
Banana pudding		6	
Butterscotch pudding		6	
Applesauce		6	
Chocolate pudding		6	
Total Units		24	

*Spoon bowl package

Apollo 11 Menu. [View larger](https://lsda.jsc.nasa.gov). Via lsda.jsc.nasa.gov

Requirements

Of course, these miracle meals had to be lightweight, compact, and edible in zero gravity. This last point was essential: hamburger buns are still banned on space flights because of the crumb casualties that might result (which is why [tortillas are so popular](#) aboard the International Space Station). Until very recently, all drinks had to be sucked out of straws. Even the smallest drop of tomato juice had to be caught, in case it interfered with the craft in some way.

Another less obvious problem with space food was what to do with it once served its purpose and left the astronauts' bodies. The pleasant euphemism NASA created for this is "low residue." The other unpleasant fact is that in-flight nausea and other "undesirable physiological responses" during earlier Apollo missions had been attributed to food. There's nothing worse in a cramped, stuffy space cabin than a fellow astronaut with "enhanced gastric awareness."

To combat some of these difficulties, NASA scientists employed the "wet pack" food technology developed on Apollo 8. A wet pack allowed thermo-stabilized food to retain

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its moisture content, thereby saving astronauts valuable food prep time. It also allowed them to see and smell what they were eating, rendering Beef and Potatoes a bit more appetizing.

The spoon-bowl packet



Apollo 11 Beef with vegetables in the spoon-bowl package, before and after rehydration. [View larger](#). Photo via nasm.si.edu



Figure 19. - Rehydratable-food spoon-bowl package with water dispenser inserted in the rehydration valve.

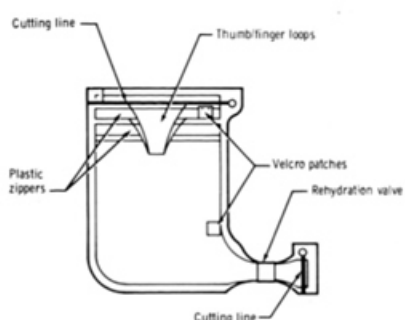


Figure 20. - Rehydratable-food spoon-bowl package.

Spoon-bowl packaging schematics. Via history.nasa.gov (pdf)

A major improvement in food technology from the Apollo 11 mission was the spoon-bowl packet, allowing for food to be rehydrated and warmed in a pouch, which was then opened with a plastic zipper and eaten with a spoon. The moisture in the food made it cling to the spoon, even in a reduced-gravity environment. Sausage Patties, Pork With Scalloped Potatoes, and Chicken Stew were some of the delicacies packed in spoon-bowls and enjoyed by our guys in space during the Apollo 11 mission.

Beverages

Some of the most telling details about space appetites on Apollo 11 come from the beverage side of things. For the first time, coffee was brought up for the astronauts: fifteen cups for each man, with Aldrin requesting black, Michael Collins with sugar, and Neil Armstrong's light and sweet. Oddly enough, Tang, the orange-flavored drink powder associated so closely with the early space program, was not aboard Apollo 11.

In *First Man: The Life of Neil A. Armstrong*, by James R Hansen, Adlrin said, "I can't speak for the other flights, but before ours, the three of us dutifully sampled the orange drink and instead chose an orange-grapefruit mixture as our citrus drink." Also MIA was that staple of science museum gift shops, astronaut ice cream. The astronauts settled instead on desserts like bite-sized brownies and pineapple cake.

But how did the food taste?



Apollo 11 Peaches (left). Chocolate pudding (right). [View larger](#). Photo via [nasm.si.edu](#)

All of this spoon-bowl and wet pack talk leads us to ask the question, "How did it taste?" There's surprisingly little data about that. Dr. Malcolm Smith, the Chief of Food and Nutrition at NASA for the Apollo 11 flight, reported in the [Autumn 1969 edition of *Nutrition Today*](#) (paid article) that astronauts Armstrong, Aldrin, and Collins "enjoyed the food we had put aboard. The variety was satisfactory, and there was enough to satisfy their hunger and maintain their performance."

Buzz Aldrin enjoyed the shrimp cocktail, explaining later that, "The shrimp were chosen one by one to be sure they would be tiny enough to squeeze out of the food packet, and they were delicious!" From *First Man: The Life of Neil A. Armstrong* we [learn](#) that Neil Armstrong's favorite meal was spaghetti with meat sauce, scalloped potatoes, fruitcake cubes, and grape punch, a spread that certainly sounds [Retro Recipe](#) ready.



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Twin City Area Highlights

MOON SPACEMEN WON'T EAT GREEN CHEESE



Whirlpool Announces Lunar Fare

Local Industry Prepares Food For Apollo 11

When Apollo 11 astronauts land on the moon, they will be eating meals prepared by Whirlpool Corp. of the Twin Cities, Whirlpool Corporation.

Neil Armstrong and Edwin Aldrin will spend about 16 hours on moon. Between the two exploratory and mail packets, they will eat low meals there.

Four low-calculated meals in two packets on the moon will consist of ham squares, peach cubes, pineapple cubes, grapefruit drink and coffee.

The second meal will contain beef stew, cream of chicken soup, blueberries, grape punch and orange drink. In addition to the meals, other foods such as fruit, candy, extra batteries, and tools, sundries and record, and listed will be included.

The food items are similar to the type used in previous space missions. Even-sized bite-size foods, those eaten directly from the packets, and indigestible freeze-dried foods.



MOON MEAL: Whirlpool Corp. has announced the first scheduled meal to be eaten on the moon will consist of ham squares, peach cubes, pineapple grapefruit drink and coffee. Whirlpool Corp. is preparing meals for the flight of Apollo 11 next month that is scheduled to include a landing on the moon.

FIRE THREATENS DOWNTOWN STORES: Shuts located on Main street near Pipestone street in downtown Denton Harbor were threatened Saturday when a fire broke out in the American's Book store.

Store company, Wilder's Book store and in the restaurant. Firemen said that the fire could have been very serious if they had arrived five minutes later. Main street was blocked and traffic diverted.

The News Palladium, June 30, 1969. [View PDF](#). Echoing the Obama food craze, newspapers ran article after article about food aboard Apollo 11. Via [blogs.nature.com](#)

Conclusion

The 1974 [case document](#) (pdf) about Apollo food systems reveals the hard work and care that went into feeding astronauts. Thermo-stabilized hot dogs, packs of dehydrated chicken salad and the like were all the "result of the efforts of a large group of people of diverse backgrounds, interests, and skills." Each person in this group was "caught up in a desire to contribute to a glamorous, adventuresome, and authentic program of space exploration" during the Apollo missions.

Food technology might seem like small space potatoes when compared to the intricacies of rocketry and climate control systems, but the physical and mental well-being of the astronauts, and by extension the success of the mission, depended on details as small as cheddar cheese spread and brownie bites.

—Stephanie Butler

Video: NASA Apollo 11: Chicken Stew: "Delicious"