Food and how it is eaten and packaged have been greatly affected by the unique microgravity environment of space. A microgravity environment is one in which gravity’s effects are greatly reduced. Microgravity occurs when a spacecraft orbits Earth. The spacecraft and all its contents are in a state of freefall. This is why a handful of candy seems to float through the Space Shuttle when it is released. The candy does not drop to the floor of the Shuttle because the floor is falling, too.

Because of this phenomenon, foods are packaged and served to prevent food from moving about the Space Shuttle or ISS. Crumbs and liquids could damage equipment or be inhaled. Many of the foods are packaged with liquids. Liquids hold foods together and, freed from containers, cling to themselves in large drops because of cohesion. It is similar to a drop of water on a piece of wax paper. The only difference is that this drop of water is moving about the microgravity environment of the Space Shuttle. Special straws are used for drinking the liquids. They have clamps that can be closed to prevent the liquids from creeping out by the processes of capillary action and surface tension when not being consumed.

Microgravity also causes the utensils used for dining to float away. The knife, fork, spoon, and scissors are secured to magnets on the food tray when they are not being used. The effects of microgravity have had an enormous impact on the development of space food packaging, food selection, and related food system requirements.
1. Shuttle galley.
2. Shuttle food tray top view.
3. Shuttle food tray bottom view, strap closed.
4. Shuttle food tray bottom view, strap open.
5. Shuttle rehydratable container components.
6. Shuttle stowage tray. Space Shuttle food is stowed in labeled pullout drawers in the middeck. Drawer contents are covered with a mesh, which allows top viewing of the drawer contents.

7. Shuttle galley. The Shuttle food galley consists of two parts: forced air convection oven and a rehydration station where hot, cold, or ambient temperature water can be dispensed.
8. Shuttle beverage packaging components.
9. Shuttle rehydratable food package. Top and bottom view of broccoli au gratin. Label shows name, preparation, and batch number. Bottom has Velcro for attachment to the Shuttle food tray.
10. Shuttle beverage containers.
11. Astronaut Dr. Franklin R. Chang-Diaz prepares a tortilla at the Shuttle food galley.