



# Space Nutrition



Volume 1

Collecting Data in Space

Issue #4

## Space Food Facts

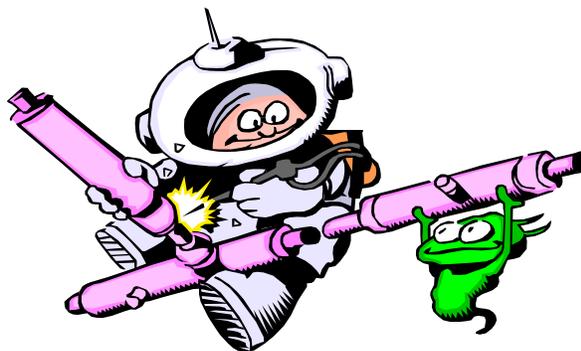
On research flights like STS-107, the astronauts will log their food using a barcode reader like the ones used in grocery stores. The barcode reader will record what, when, and how much of each food item was eaten, by whom. It will also be used to log all samples collected during the flight.



## Career Facts

The leader of the research team, also called the Principal Investigator or PI, usually writes the research proposal that begins a scientific study. For E381, the PI is a research nutritionist with a Ph.D. (or doctorate) in Nutrition. The other scientists who make up the research team are called co-investigators. Our co-investigators have varied backgrounds and include a medical doctor, a biochemist, and a mathematician. All of these skills will be needed to interpret the data collected for this experiment.

Preparations for E381, "Calcium Kinetics During Space Flight," began in 1999. Before data can be collected during space flight, there is an extensive review of every aspect of the experiment. These are some of the important questions to be answered in the planning stage: whether the crew has enough time for all planned activities; whether any of the E381 procedures could affect another experiment (or if other experiments could affect E381); whether the freezer on the shuttle can hold the number of samples we want to collect; and whether any new hardware needs to be developed to conduct the experiment. All of the documents for E381 were reviewed several times by many groups and individuals, including hardware engineers, biomedical engineers, nutritionists, and crew trainers. They need to make sure everybody understands exactly what must be done for the experiment to be successful.



Data collection for E381, step 3 in the scientific method, consists of 6 mini-studies: 2 of these are conducted before the mission, 2 are conducted on board the shuttle, and 2 on return to Earth. The experiment will require several special pieces of equipment or hardware to be flown on the shuttle. Astronauts will collect their urine in special bags called urine collection devices (UCDs). Because storage space for urine samples is limited, only a part of each collection is saved. But we can tell how large the whole sample was because a chemical marker is added to the UCDs before they are flown. The astronauts will use special syringes to take samples from each UCD, and store these syringes in a freezer on the shuttle.

## Did you know?



E381 has been combined with 3 other life sciences experiments, which will collect similar samples and use similar hardware. This

group of experiments is called the Physiology and Biochemistry-4 experiments - or PhAB-4 for short.

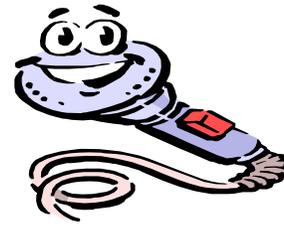
- A centrifuge is a piece of equipment that spins samples to separate their components on the basis of weight. The centrifuge flown on the shuttle has been specially modified for space flight.
- Hardware flown on the shuttle is usually tested on the KC-135 plane or "vomit comet." The KC-135 flies in parabolas. Each parabola creates about 30 seconds of weightlessness. A typical flight has 40 parabolas.



## Word of the Month

**Parabola**

Can you guess what this word means? Look for the meaning of the "Word of the Month" in the next issue of Space Nutrition



## FUN CORNER

Find these space science words:

Investigator  
Procedures  
Space  
Orbit  
Centrifuge

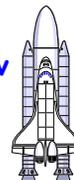
Barcode  
Hardware  
Parabola  
Test

Engineers  
Scientist  
Experiment  
Review  
Vomit Comet

I	P	T	E	M	O	C	T	I	M	O	V
C	N	B	T	E	B	A	R	C	O	D	E
E	F	V	H	K	M	A	R	S	V	U	T
R	O	L	E	N	G	I	N	E	E	R	S
A	S	I	X	S	S	N	S	K	T	E	E
W	P	M	P	O	T	E	S	T	A	V	R
D	H	B	E	Y	O	I	I	L	M	I	U
R	O	H	R	A	R	C	G	G	I	E	D
A	Q	I	I	E	B	N	S	A	C	W	E
H	E	U	M	S	I	R	R	O	T	T	C
S	C	I	E	N	T	I	S	T	M	O	O
T	A	N	N	D	C	V	O	F	Q	N	R
C	P	M	T	A	L	O	B	A	R	A	P
R	S	C	E	N	T	R	I	F	U	G	E

Check out these cool NASA links for more fun space science facts:

<http://virtualastronaut.jsc.nasa.gov>  
<http://lsda.jsc.nasa.gov>  
<http://criticalpath.jsc.nasa.gov>



Check out the Nutritional Biochemistry Laboratory's website for more information about nutrition and space.

[www.jsc.nasa.gov/sa/sd/facility/nutrition.htm](http://www.jsc.nasa.gov/sa/sd/facility/nutrition.htm)