1
00:00:09,080 --> 00:00:06,680
food its preparation storage and use in

2
00:00:12,410 --> 00:00:09,090
space travel has changed along with

3
00:00:15,140 --> 00:00:12,420
advances in spaceflight technology today

4
00:00:18,170 --> 00:00:15,150
astronauts prepare and eat food much the

5
00:00:19,490 --> 00:00:18,180
same way we do here on earth the biggest

6
00:00:21,679 --> 00:00:19,500
difference is that their food is

7
00:00:24,470 --> 00:00:21,689
packaged so it can be eaten at zero

8
00:00:26,810 --> 00:00:24,480
gravity shuttle astronaut Joe Allen

9
00:00:28,880 --> 00:00:26,820
wrote about life aboard the shuttle the

10
00:00:30,769 --> 00:00:28,890
astronauts who now enter space where

11
00:00:33,350 --> 00:00:30,779
sport shirts and slacks during their

12
00:00:35,750 --> 00:00:33,360
days in orbit they eat shrimp cocktail

13
00:00:38,360 --> 00:00:35,760

and barbecued beef and sleep in private

14
00:00:42,860 --> 00:00:38,370
bunks the Spartan era of space travel

15
00:00:44,840 --> 00:00:42,870
has ended the Spartan era Allen refers

16
00:00:47,630 --> 00:00:44,850
to began with the manned flights of the

17
00:00:49,490 --> 00:00:47,640
Mercury program the first food for

18
00:00:51,470 --> 00:00:49,500
American space travel was carried aboard

19
00:00:56,270 --> 00:00:51,480
John Glenn's historic five-hour flight

20
00:00:58,310 --> 00:00:56,280
in 1962 food for the mercury flights had

21
00:01:00,319 --> 00:00:58,320
to be easy to prepare and eat by the

22
00:01:02,510 --> 00:01:00,329
astronaut dressed in a restrictive

23
00:01:06,460 --> 00:01:02,520
pressure suit and strapped inside the

24
00:01:09,050 --> 00:01:06,470
capsule food was packaged in tubes

25
00:01:13,670 --> 00:01:09,060
freeze-dried pouches and bite sized

26
00:01:16,130 --> 00:01:13,680
cubes and was not very appetizing the

27
00:01:19,190 --> 00:01:16,140
Gemini missions beginning in 1965

28
00:01:21,050 --> 00:01:19,200
brought an improved food concept food

29
00:01:23,890 --> 00:01:21,060
tubes were replaced by simple

30
00:01:26,359 --> 00:01:23,900
lightweight plastic containers

31
00:01:28,670 --> 00:01:26,369
astronauts could choose from an expanded

32
00:01:30,710 --> 00:01:28,680
menu chunks of food were coated with

33
00:01:33,020 --> 00:01:30,720
gelatin to reduce crumbling in zero

34
00:01:34,910 --> 00:01:33,030
gravity and rehydrate able food was

35
00:01:39,319 --> 00:01:34,920
placed in containers which were easier

36
00:01:41,510 --> 00:01:39,329
to inject with water the three men crews

37
00:01:43,670 --> 00:01:41,520
of the Apollo era enjoyed greater menu

38
00:01:46,219 --> 00:01:43,680

selections and for the first time made

39
00:01:50,179 --> 00:01:46,229
use of hot water astronauts could now

40
00:01:52,789 --> 00:01:50,189
enjoy hot food and drinks foil pouches

41
00:01:55,069 --> 00:01:52,799
for meats and sauces and spoon Bowl

42
00:02:00,530 --> 00:01:55,079
packages for rehydrate abels were also

43
00:02:02,690 --> 00:02:00,540
introduced in 1973 Skylab became our

44
00:02:05,149 --> 00:02:02,700
major space effort the orbiting

45
00:02:07,700 --> 00:02:05,159
laboratory housed three astronauts for

46
00:02:10,669 --> 00:02:07,710
up to three months the food system was

47
00:02:12,800 --> 00:02:10,679
luxurious even by today's standards the

48
00:02:13,850 --> 00:02:12,810
separate dining area boasted a table

49
00:02:16,010 --> 00:02:13,860
complete with food

50
00:02:19,100 --> 00:02:16,020
warming trays for all three astronauts

51
00:02:21,200 --> 00:02:19,110
to enjoy dining together the dietitian

52
00:02:24,620 --> 00:02:21,210
for technology incorporated in Houston

53
00:02:26,810 --> 00:02:24,630
Texas Connie stadler planet Skylab flew

54
00:02:29,600 --> 00:02:26,820
the whole entire food system within can

55
00:02:31,460 --> 00:02:29,610
and we had frozen food at that time

56
00:02:33,260 --> 00:02:31,470
because there was a lot of storage space

57
00:02:35,420 --> 00:02:33,270
on Skylab they were going to be up there

58
00:02:36,770 --> 00:02:35,430
for such a long period of time that they

59
00:02:39,170 --> 00:02:36,780
thought the food system was very

60
00:02:42,830 --> 00:02:39,180
important and so during that time they

61
00:02:44,870 --> 00:02:42,840
had three frozen foods allotted to them

62
00:02:48,380 --> 00:02:44,880
every two day period and they could have

63
00:02:50,360 --> 00:02:48,390

ice cream or steak or roast beef we had

64
00:02:53,600 --> 00:02:50,370
at that time now there's no

65
00:02:55,400 --> 00:02:53,610
refrigeration and no freezer so we're

66
00:02:57,949 --> 00:02:55,410
back to the rehydrate about food system

67
00:03:00,380 --> 00:02:57,959
but the packages are different in 1975

68
00:03:03,500 --> 00:03:00,390
international efforts in space resulted

69
00:03:06,010 --> 00:03:03,510
in the apollo-soyuz mission the American

70
00:03:09,020 --> 00:03:06,020
and Russian ships docked in Earth orbit

71
00:03:12,190 --> 00:03:09,030
cosmonauts and astronauts shared space

72
00:03:16,160 --> 00:03:12,200
foods including borscht served in a tube

73
00:03:18,530 --> 00:03:16,170
at present astronauts on the space

74
00:03:21,530 --> 00:03:18,540
shuttle use a new flexible food system

75
00:03:23,690 --> 00:03:21,540
complete with galley the gaui an upright

76
00:03:27,680 --> 00:03:23,700
modular unit located on the mid-deck

77
00:03:30,110 --> 00:03:27,690
serves as a food processing facility it

78
00:03:33,050 --> 00:03:30,120
houses a low temperature oven a hot and

79
00:03:36,800 --> 00:03:33,060
cold water dispenser a pantry and a

80
00:03:39,110 --> 00:03:36,810
personal hygiene station a crew of two

81
00:03:42,800 --> 00:03:39,120
to seven people can be served for up to

82
00:03:44,860 --> 00:03:42,810
one month over 70 food items and 20

83
00:03:49,850 --> 00:03:44,870
beverages are featured in the six-day

84
00:03:51,590 --> 00:03:49,860
rotational space shuttle menu drinks and

85
00:03:54,050 --> 00:03:51,600
freeze-dried meals selections are

86
00:03:56,180 --> 00:03:54,060
packaged in polyethylene dishes and can

87
00:04:01,310 --> 00:03:56,190
be hydrated with pre-selected amounts of

88
00:04:03,140 --> 00:04:01,320

hot or cold water canned foods foods and

89
00:04:06,380 --> 00:04:03,150
flexible pouches and fresh fruits and

90
00:04:09,570 --> 00:04:06,390
vegetables are also available

91
00:04:11,580 --> 00:04:09,580
all food has to pass strict shelf-life

92
00:04:14,220 --> 00:04:11,590
standards as well as show minimum

93
00:04:15,750 --> 00:04:14,230
microbial counts much of the food used

94
00:04:17,970 --> 00:04:15,760
aboard the shuttle is bought

95
00:04:20,000 --> 00:04:17,980
commercially and then repackaged and

96
00:04:23,220 --> 00:04:20,010
serialized at technology incorporated

97
00:04:25,590 --> 00:04:23,230
Houston Texas on occasion food is

98
00:04:27,620 --> 00:04:25,600
processed in house like this patch of

99
00:04:30,180 --> 00:04:27,630
color flower which will be freeze-dried

100
00:04:32,040 --> 00:04:30,190
this processing is done only if

101
00:04:36,840 --> 00:04:32,050
commercial product quality is below

102
00:04:39,710 --> 00:04:36,850
standard or not available fresh foods

103
00:04:43,440 --> 00:04:39,720
are packed within 24 hours of liftoff

104
00:04:45,660 --> 00:04:43,450
food for space as missions become longer

105
00:04:47,640 --> 00:04:45,670
the challenge of the next decade will be

106
00:04:49,350 --> 00:04:47,650
to provide a food system which will