

STATION
LIFE



1
00:00:16,230 --> 00:00:13,990
today we're going to talk about

2
00:00:18,070 --> 00:00:16,240
nutrition and the role it plays to keep

3
00:00:20,550 --> 00:00:18,080
astronauts healthy on the international

4
00:00:36,470 --> 00:00:20,560
space station hi i'm nasa astronaut

5
00:00:41,430 --> 00:00:38,950
good nutrition is a part of good health

6
00:00:43,430 --> 00:00:41,440
whether you're on earth or off

7
00:00:45,430 --> 00:00:43,440
today's show will focus on nutrition

8
00:00:46,389 --> 00:00:45,440
research aboard the international space

9
00:00:49,190 --> 00:00:46,399
station

10
00:00:52,389 --> 00:00:49,200
that's one small bite for man one giant

11
00:00:54,790 --> 00:00:52,399
leaf for mankind astronauts scott kelly

12
00:00:56,389 --> 00:00:54,800
chell lundgren and kimya yui of japan

13
00:00:59,029 --> 00:00:56,399

recently sampled the fruits of their

14

00:01:01,510 --> 00:00:59,039

labor after growing and harvesting a

15

00:01:03,750 --> 00:01:01,520

crop of outregis red romaine lettuce

16

00:01:05,750 --> 00:01:03,760

from the veggie plant growth facility

17

00:01:08,310 --> 00:01:05,760

this was the first crop of vegetables

18

00:01:10,710 --> 00:01:08,320

grown in space specifically for the

19

00:01:13,350 --> 00:01:10,720

purpose of providing fresh vegetables

20

00:01:15,590 --> 00:01:13,360

for the astronauts later this month the

21

00:01:17,830 --> 00:01:15,600

crew will harvest zinnia flowers a

22

00:05:02,629 --> 00:01:17,840

precursor for the next crop we're going

23

00:05:07,830 --> 00:05:05,029

you know living in space changes our

24

00:05:10,469 --> 00:05:07,840

bodies in a number of ways we lose bone

25

00:05:12,950 --> 00:05:10,479

mineral density our muscles atrophy our

26
00:05:15,670 --> 00:05:12,960
cardiovascular system gets weaker and we

27
00:05:17,590 --> 00:05:15,680
experience immune system dysfunction

28
00:05:19,350 --> 00:05:17,600
one of the ways of understanding the

29
00:05:21,749 --> 00:05:19,360
changes in our bodies during long

30
00:05:24,150 --> 00:05:21,759
duration space flight is to study our

31
00:05:26,230 --> 00:05:24,160
nutritional status at specific time

32
00:05:28,150 --> 00:05:26,240
points during our mission

33
00:05:30,230 --> 00:05:28,160
samples that we collect while we're in

34
00:05:33,189 --> 00:05:30,240
space provide scientists with

35
00:05:35,990 --> 00:05:33,199
information on bone metabolism oxidative

36
00:05:37,110 --> 00:05:36,000
damage body chemistry and hormonal

37
00:05:39,350 --> 00:05:37,120
changes

38
00:05:41,430 --> 00:05:39,360

these insights give scientists a more

39

00:05:42,870 --> 00:05:41,440

complete picture about what's happening

40

00:05:45,189 --> 00:05:42,880

in our bodies

41

00:05:47,270 --> 00:05:45,199

that increased understanding of the role

42

00:05:49,430 --> 00:05:47,280

of nutrition and adaptation to space

43

00:05:52,150 --> 00:05:49,440

flight has a broader application on

44

00:05:54,870 --> 00:05:52,160

earth one example is understanding the

45

00:05:56,870 --> 00:05:54,880

relationship of nutrition to bone loss

46

00:05:59,350 --> 00:05:56,880

this is potentially valuable for people

47

00:06:00,870 --> 00:05:59,360

suffering from osteoporosis right here

48

00:06:02,950 --> 00:06:00,880

on earth

49

00:06:05,430 --> 00:06:02,960

the bones in our bodies are alive

50

00:06:06,790 --> 00:06:05,440

growing and changing all the time

51
00:06:08,710 --> 00:06:06,800
our bones are composed of different

52
00:06:11,029 --> 00:06:08,720
layers the outer surface of bone is

53
00:06:12,710 --> 00:06:11,039
called cortical bone this is the smooth

54
00:06:14,550 --> 00:06:12,720
hard part of the bone that we can see

55
00:06:16,469 --> 00:06:14,560
when we look at a skeleton inside the

56
00:06:18,390 --> 00:06:16,479
cortical bone is the trabecular bone

57
00:06:21,510 --> 00:06:18,400
this type of bone looks like a sponge

58
00:06:23,270 --> 00:06:21,520
and helps to protect the bone marrow

59
00:06:25,990 --> 00:06:23,280
the constant process of bones growing

60
00:06:27,749 --> 00:06:26,000
and changing is known as bone remodeling

61
00:06:29,870 --> 00:06:27,759
this process is carried out by specific

62
00:06:31,990 --> 00:06:29,880
cells in our bones cells called

63
00:06:33,990 --> 00:06:32,000

osteoclasts have the role of breaking

64

00:06:35,909 --> 00:06:34,000

down our bone and removing any parts

65

00:06:37,350 --> 00:06:35,919

that need replacing

66

00:06:39,909 --> 00:06:37,360

at the same time cells called

67

00:06:41,670 --> 00:06:39,919

osteoblasts have the job of making new

68

00:06:43,749 --> 00:06:41,680

bone and helping to repair any parts of

69

00:06:46,070 --> 00:06:43,759

the bone that have been damaged

70

00:06:47,990 --> 00:06:46,080

on earth and healthy individuals this

71

00:06:50,150 --> 00:06:48,000

process is normally balanced so that the

72

00:06:54,790 --> 00:06:50,160

same amount of bone is made and broken

73

00:06:58,870 --> 00:06:56,870

in space astronauts are exposed to lower

74

00:07:00,390 --> 00:06:58,880

levels of gravity than on earth this

75

00:07:01,909 --> 00:07:00,400

means that they have less mechanical

76

00:07:02,950 --> 00:07:01,919

stress put on their bones as they move

77

00:07:04,550 --> 00:07:02,960

around

78

00:07:06,070 --> 00:07:04,560

scientists believe that the bones

79

00:07:07,749 --> 00:07:06,080

naturally try to adapt to this new

80

00:07:09,110 --> 00:07:07,759

environment by increasing the rate that

81

00:07:11,749 --> 00:07:09,120

the bone is broken down by the

82

00:07:13,510 --> 00:07:11,759

osteoclasts meanwhile bone formation

83

00:07:15,110 --> 00:07:13,520

continues to occur at the same rate as

84

00:07:16,790 --> 00:07:15,120

it does on earth

85

00:07:18,469 --> 00:07:16,800

the result is an imbalance in bone

86

00:07:22,150 --> 00:07:18,479

remodeling which leads to an overall

87

00:07:23,909 --> 00:07:22,160

decrease in bone mineral density

88

00:07:25,350 --> 00:07:23,919

while in space astronauts can manage

89

00:07:27,430 --> 00:07:25,360

with lower bone density but when they

90

00:07:29,510 --> 00:07:27,440

return their bones are less able to cope

91

00:07:31,830 --> 00:07:29,520

with earth's gravity this increases the

92

00:07:33,270 --> 00:07:31,840

risk of fracture and injury scientists

93

00:07:35,430 --> 00:07:33,280

use many different tests to measure the

94

00:07:37,589 --> 00:07:35,440

density of the astronauts bones results

95

00:07:39,830 --> 00:07:37,599

show that the astronauts while in space

96

00:07:42,070 --> 00:07:39,840

lose bone in a similar pattern to people

97

00:07:44,070 --> 00:07:42,080

on earth who suffer from osteoporosis

98

00:07:47,189 --> 00:07:44,080

but the astronauts lose it at a much

99

00:07:50,710 --> 00:07:48,950

scientists have found that exercise when

100

00:07:53,270 --> 00:07:50,720

combined with good nutrition and

101
00:07:54,869 --> 00:07:53,280
increased vitamin d intake is able to

102
00:07:56,629 --> 00:07:54,879
preserve some of the bone that was

103
00:07:58,790 --> 00:07:56,639
previously being lost

104
00:08:00,629 --> 00:07:58,800
since 2008 astronauts have been able to

105
00:08:02,950 --> 00:08:00,639
use a new exercise machine called the

106
00:08:05,510 --> 00:08:02,960
advanced resistive exercise device or a

107
00:08:07,749 --> 00:08:05,520
red it is thought that this increase in

108
00:08:09,189 --> 00:08:07,759
force triggers the formation of new bone

109
00:08:11,430 --> 00:08:09,199
bringing more balance to the bone

110
00:08:13,110 --> 00:08:11,440
remodeling process and allowing the bone

111
00:08:16,869 --> 00:08:13,120
density to stay at roughly the same

112
00:08:18,469 --> 00:08:16,879
level as it was before the space flight

113
00:08:20,469 --> 00:08:18,479

it is a significant achievement to be

114

00:08:22,070 --> 00:08:20,479

able to maintain bone density in space

115

00:08:23,749 --> 00:08:22,080

but more experiments need to be carried

116

00:08:25,909 --> 00:08:23,759

out to see whether the new bone which is

117

00:08:27,830 --> 00:08:25,919

formed in space has the same structure

118

00:08:29,830 --> 00:08:27,840

and strength as new bone which is formed

119

00:08:31,830 --> 00:08:29,840

on earth understanding bone loss

120

00:08:33,909 --> 00:08:31,840

associated with microgravity may lead to

121

00:08:35,670 --> 00:08:33,919

better preventive care or therapeutic

122

00:08:37,750 --> 00:08:35,680

treatments for people on earth suffering

123

00:08:40,550 --> 00:08:37,760

bone loss as a result of bone diseases

124

00:08:47,509 --> 00:08:40,560

like osteopenia and osteoporosis or for

125

00:08:49,829 --> 00:08:48,870

one of the things that i think one of

126

00:08:51,110 --> 00:08:49,839

the things i love about the field of

127

00:08:52,630 --> 00:08:51,120

nutrition one of things that really drew

128

00:08:54,630 --> 00:08:52,640

me into the field of nutrition as a

129

00:08:56,230 --> 00:08:54,640

graduate student was the fact that

130

00:08:57,509 --> 00:08:56,240

nutrition really is a cross-cutting

131

00:08:59,829 --> 00:08:57,519

science and

132

00:09:01,990 --> 00:08:59,839

the fact that we get to look at

133

00:09:03,910 --> 00:09:02,000

all the systems and nutrition in and of

134

00:09:05,269 --> 00:09:03,920

itself so doing bone studies and muscle

135

00:09:07,990 --> 00:09:05,279

studies and

136

00:09:10,230 --> 00:09:08,000

studies

137

00:09:12,230 --> 00:09:10,240

really helps to to branch out and to

138

00:09:14,150 --> 00:09:12,240

work with other groups and see

139

00:09:16,470 --> 00:09:14,160

the integration within the human being

140

00:09:19,190 --> 00:09:16,480

and not just focused on a specific

141

00:09:20,710 --> 00:09:19,200

enzyme with a specific tissue in a

142

00:09:22,710 --> 00:09:20,720

petri additional lab somewhere in a

143

00:09:24,710 --> 00:09:22,720

basement one of the great things about

144

00:09:25,750 --> 00:09:24,720

nutrition research on space station is

145

00:09:29,750 --> 00:09:25,760

that

146

00:09:31,829 --> 00:09:29,760

it allows us to study

147

00:09:33,590 --> 00:09:31,839

very healthy individuals

148

00:09:35,110 --> 00:09:33,600

in a very strange environment in a very

149

00:09:36,630 --> 00:09:35,120

unique environment that the body is

150

00:09:38,230 --> 00:09:36,640

trying to adapt to

151

00:09:40,070 --> 00:09:38,240

and what that does that allows us to

152

00:09:41,350 --> 00:09:40,080

understand how the body responds to

153

00:09:43,509 --> 00:09:41,360

these changes

154

00:09:45,910 --> 00:09:43,519

and in many ways that reflects disease

155

00:09:48,150 --> 00:09:45,920

patterns or altered physiology if you

156

00:09:49,750 --> 00:09:48,160

will on earth so bone is a great example

157

00:09:51,910 --> 00:09:49,760

where when an astronaut is put into

158

00:09:54,389 --> 00:09:51,920

space flight the body starts to break

159

00:09:56,070 --> 00:09:54,399

down bone because the body realizes it

160

00:09:58,470 --> 00:09:56,080

doesn't need the same skeleton in

161

00:10:00,150 --> 00:09:58,480

weightlessness as it did on earth

162

00:10:02,470 --> 00:10:00,160

and by looking at that adaptation and

163

00:10:04,230 --> 00:10:02,480

how to counteract that adaptation

164

00:10:05,910 --> 00:10:04,240

that tells us about how the body

165

00:10:08,710 --> 00:10:05,920

responds to

166

00:10:09,750 --> 00:10:08,720

to these different changes so we see

167

00:10:11,509 --> 00:10:09,760

roughly

168

00:10:13,590 --> 00:10:11,519

the same change in bone in about six

169

00:10:15,590 --> 00:10:13,600

months on a space station mission as you

170

00:10:18,150 --> 00:10:15,600

would see in a much longer period four

171

00:10:20,550 --> 00:10:18,160

or five years so it's almost like time

172

00:10:22,870 --> 00:10:20,560

lapse photography where we can see

173

00:10:24,790 --> 00:10:22,880

a much faster glimpse of what's going on

174

00:10:25,750 --> 00:10:24,800

we can study countermeasures much more

175

00:10:27,430 --> 00:10:25,760

quickly

176

00:10:29,430 --> 00:10:27,440

and again the implications of those

177

00:10:31,190 --> 00:10:29,440

studies for people studying those same

178

00:10:32,710 --> 00:10:31,200

phenomena on earth

179

00:10:34,150 --> 00:10:32,720

really helps to leap frog some of the

180

00:10:36,470 --> 00:10:34,160

technology ahead

181

00:10:37,990 --> 00:10:36,480

hi my name is scott smith i'm the lead

182

00:10:39,590 --> 00:10:38,000

for the nutritional biochemistry lab at

183

00:10:41,190 --> 00:10:39,600

the johnson space center

184

00:11:06,790 --> 00:10:41,200

and we're studying nutrition off the

185

00:11:11,190 --> 00:11:09,750

in space and on earth our bodies require

186

00:11:13,030 --> 00:11:11,200

proper nutrition

187

00:11:15,350 --> 00:11:13,040

defining the nutrient requirements for

188

00:11:17,509 --> 00:11:15,360

space flight and ensuring provision and

189

00:11:19,750 --> 00:11:17,519

intake of those nutrients are primary

190

00:11:23,190 --> 00:11:19,760

issues for astronaut health and mission

191

00:11:25,269 --> 00:11:23,200

success after all you are what you eat

192

00:11:27,190 --> 00:11:25,279

one challenge is providing appetizing

193

00:11:30,310 --> 00:11:27,200

food for astronauts that doesn't require

194

00:11:31,990 --> 00:11:30,320

refrigeration and has a long shelf life

195

00:11:33,829 --> 00:11:32,000

while the food is generally much better

196

00:11:35,829 --> 00:11:33,839

than you might imagine and we have come

197

00:11:38,630 --> 00:11:35,839

a long way since the early days of space

198

00:11:39,990 --> 00:11:38,640

flight we do have limited access to

199

00:11:42,230 --> 00:11:40,000

fresh foods

200

00:11:45,590 --> 00:11:42,240

in our next segment we'll go inside

201
00:11:47,509 --> 00:11:45,600
nasa's space food systems laboratory as

202
00:11:54,069 --> 00:11:47,519
seen in the national geographic space

203
00:11:54,079 --> 00:12:00,150
eating in space is its own kind of fun

204
00:12:12,870 --> 00:12:02,470
but keeping astronauts fit and healthy

205
00:12:17,190 --> 00:12:15,110
michelle clinch is responsible for what

206
00:12:19,829 --> 00:12:17,200
they eat

207
00:12:22,310 --> 00:12:19,839
we're making spaghetti with meat sauce

208
00:12:24,629 --> 00:12:22,320
space meals begin just like ours do with

209
00:12:28,230 --> 00:12:24,639
a trip to the supermarket thank you but

210
00:12:33,350 --> 00:12:30,069
spaghetti and meat sauce is just one of

211
00:12:37,269 --> 00:12:33,360
the 250 things on the space station menu

212
00:12:39,829 --> 00:12:37,279
each portion is meticulously calibrated

213
00:12:42,710 --> 00:12:39,839

we have a database where we maintain the

214

00:12:45,829 --> 00:12:42,720

nutritional content of all our products

215

00:12:47,509 --> 00:12:45,839

calories fat protein carbohydrate things

216

00:12:49,590 --> 00:12:47,519

like that

217

00:12:51,509 --> 00:12:49,600

but the most important calculation is

218

00:12:53,670 --> 00:12:51,519

what things weigh

219

00:12:56,150 --> 00:12:53,680

that's because it cost ten thousand

220

00:12:58,550 --> 00:12:56,160

dollars for every pound blasted off to

221

00:13:01,030 --> 00:12:58,560

the astronauts

222

00:13:05,350 --> 00:13:01,040

so nasa adopted a reduction technique

223

00:13:09,910 --> 00:13:08,069

freeze drying removes a high percentage

224

00:13:11,590 --> 00:13:09,920

of the moisture so typically when we

225

00:13:15,430 --> 00:13:11,600

freeze dry our products we take them

226

00:13:25,269 --> 00:13:18,389

each portion now weighs just one ounce

227

00:13:30,949 --> 00:13:28,550

1300 miles away and the orbital cygnus

228

00:13:35,030 --> 00:13:30,959

resupply module is being loaded with the

229

00:13:39,509 --> 00:13:37,350

and it's time for a few last minute food

230

00:13:41,350 --> 00:13:39,519

luxuries

231

00:13:44,310 --> 00:13:41,360

these are the tortillas they're very

232

00:13:46,550 --> 00:13:44,320

popular on orbit after a daily routine

233

00:13:48,949 --> 00:13:46,560

of freeze-dried meals a fresh piece of

234

00:13:50,790 --> 00:13:48,959

fruit is a welcome relief well worth its

235

00:13:52,550 --> 00:13:50,800

weight in gold

236

00:13:54,949 --> 00:13:52,560

as you can see we're only sending three

237

00:13:57,350 --> 00:13:54,959

apples so you may think that's unfair

238

00:13:59,030 --> 00:13:57,360

because we have six people on orbit they

239

00:14:01,269 --> 00:13:59,040

may have to share

240

00:14:04,069 --> 00:14:01,279

this very precious cargo is one of the

241

00:14:13,910 --> 00:14:04,079

last things to be loaded onto the rocket

242

00:14:19,189 --> 00:14:16,629

less than a kilometer away from us now

243

00:14:22,150 --> 00:14:19,199

two days later cygnus docks with the

244

00:14:27,750 --> 00:14:25,509

we're getting ready to birth the

245

00:14:28,829 --> 00:14:27,760

cygnus one vehicle all right looks

246

00:14:32,790 --> 00:14:28,839

really

247

00:14:34,629 --> 00:14:32,800

good perfect nice bonus food

248

00:14:37,670 --> 00:14:34,639

including some surprise treats from

249

00:14:37,680 --> 00:14:41,990

look at that tortillas

250

00:14:42,000 --> 00:14:45,750

look at that

251
00:14:50,310 --> 00:14:48,150
wow oh my goodness gracious

252
00:14:52,710 --> 00:14:50,320
the greatest hot dog relish in the

253
00:14:55,030 --> 00:14:52,720
history of man

254
00:15:06,230 --> 00:14:55,040
oh my gosh my wife didn't tell me about

255
00:15:12,069 --> 00:15:09,590
hello and welcome to node 1.

256
00:15:14,150 --> 00:15:12,079
in the boxes you see here we keep our

257
00:15:15,990 --> 00:15:14,160
food on the international space station

258
00:15:18,629 --> 00:15:16,000
and specifically the food that we are

259
00:15:21,430 --> 00:15:18,639
currently eating and in our logistics

260
00:15:23,829 --> 00:15:21,440
module leonardo where i was just now we

261
00:15:26,150 --> 00:15:23,839
keep our supplies we keep them in soft

262
00:15:27,110 --> 00:15:26,160
containers like this one which we call

263
00:15:28,949 --> 00:15:27,120

bobs

264

00:15:31,350 --> 00:15:28,959

and this one is a very special bob for

265

00:15:33,350 --> 00:15:31,360

me because it contains my bonus food the

266

00:15:35,590 --> 00:15:33,360

food that i chose myself based on my

267

00:15:37,350 --> 00:15:35,600

preference and my taste

268

00:15:39,990 --> 00:15:37,360

this one for example is one of my

269

00:15:42,470 --> 00:15:40,000

absolute favorites it's quinoa salad

270

00:15:45,509 --> 00:15:42,480

with mackerel macaroni is a great source

271

00:15:46,470 --> 00:15:45,519

of healthy proteins but also of healthy

272

00:15:52,069 --> 00:15:46,480

fats

273

00:15:54,310 --> 00:15:52,079

needs to stay healthy and in good shape

274

00:15:57,030 --> 00:15:54,320

on board we have different kinds of fish

275

00:15:58,310 --> 00:15:57,040

which are great sources of healthy fat

276
00:16:00,710 --> 00:15:58,320
for example thanks to our russian

277
00:16:03,430 --> 00:16:00,720
colleagues we have sturgeon

278
00:16:06,069 --> 00:16:03,440
in my bonus food i also took

279
00:16:09,030 --> 00:16:06,079
sources of healthy fats that i can eat

280
00:16:11,430 --> 00:16:09,040
for a snack i love avocado for example

281
00:16:13,189 --> 00:16:11,440
so i took it in form of guacamole that i

282
00:16:14,790 --> 00:16:13,199
can spread on my bread

283
00:16:18,150 --> 00:16:14,800
or i also love

284
00:16:19,910 --> 00:16:18,160
dry fruit so i have almonds and nuts

285
00:16:21,350 --> 00:16:19,920
and i didn't forget to take

286
00:16:24,389 --> 00:16:21,360
olive oil

287
00:16:27,430 --> 00:16:24,399
and i can tell you our rehydrated

288
00:16:29,430 --> 00:16:27,440

veggies not only taste a lot better with

289

00:16:31,590 --> 00:16:29,440

olive oil but they're also a lot

290

00:16:33,350 --> 00:16:31,600

healthier

291

00:16:35,910 --> 00:16:33,360

so i hope you will

292

00:16:38,949 --> 00:16:35,920

put the right rocket fuel into your body

293

00:16:41,269 --> 00:16:38,959

starting with the right types of fat

294

00:17:19,189 --> 00:16:41,279

and remember eating healthy is not

295

00:17:24,630 --> 00:17:20,710

you know

296

00:17:26,230 --> 00:17:24,640

i don't know the reason behind it but

297

00:17:28,150 --> 00:17:26,240

your taste buds change when you get to

298

00:17:29,190 --> 00:17:28,160

space so the things that you like on

299

00:17:32,310 --> 00:17:29,200

earth

300

00:17:33,830 --> 00:17:32,320

and you you just can't get enough of

301
00:17:34,950 --> 00:17:33,840
you've got enough of when you got to

302
00:17:36,789 --> 00:17:34,960
space

303
00:17:39,750 --> 00:17:36,799
so there's something about

304
00:17:41,270 --> 00:17:39,760
your taste buds don't know what it is

305
00:17:43,750 --> 00:17:41,280
however

306
00:17:45,270 --> 00:17:43,760
aromas you don't get enough of it

307
00:17:48,390 --> 00:17:45,280
partly because of the way things are

308
00:17:49,909 --> 00:17:48,400
packaged and coffee for instance has

309
00:17:51,830 --> 00:17:49,919
this

310
00:17:53,750 --> 00:17:51,840
oh the smell that you've

311
00:17:56,310 --> 00:17:53,760
that you you kind of consume while

312
00:17:57,430 --> 00:17:56,320
you're eating the food but it's in a

313
00:17:59,830 --> 00:17:57,440

it's in a

314

00:18:01,270 --> 00:17:59,840

package that has a straw you can't smell

315

00:18:02,710 --> 00:18:01,280

anything so

316

00:18:04,549 --> 00:18:02,720

it still didn't stop me from drinking it

317

00:18:06,150 --> 00:18:04,559

but you just couldn't smell it and same

318

00:18:07,430 --> 00:18:06,160

with all the other foods they come in a

319

00:18:09,590 --> 00:18:07,440

little package and so you don't really

320

00:18:11,430 --> 00:18:09,600

smell it very well and that

321

00:18:13,350 --> 00:18:11,440

you'd miss that when you come back to

322

00:18:16,310 --> 00:18:13,360

earth you find out just how important

323

00:18:18,070 --> 00:18:16,320

smell is when you're eating it

324

00:18:21,190 --> 00:18:18,080

so

325

00:18:24,310 --> 00:18:21,200

how does the space station smell

326

00:18:27,110 --> 00:18:24,320

you know this is a good question because

327

00:18:29,990 --> 00:18:27,120

in general the space station smells like

328

00:18:31,350 --> 00:18:30,000

nothing it's clean except if you're in

329

00:18:33,110 --> 00:18:31,360

node three

330

00:18:34,710 --> 00:18:33,120

and you're working out on the a red

331

00:18:36,630 --> 00:18:34,720

machine and all of a sudden you smell

332

00:18:39,190 --> 00:18:36,640

something that you think is coming from

333

00:18:40,630 --> 00:18:39,200

the whc but it's actually which is our

334

00:18:42,549 --> 00:18:40,640

space potty

335

00:18:44,310 --> 00:18:42,559

but it's actually

336

00:18:46,870 --> 00:18:44,320

our russian

337

00:18:49,430 --> 00:18:46,880

colleagues back in this in the service

338

00:18:50,310 --> 00:18:49,440

module open up a can of

339

00:18:52,470 --> 00:18:50,320

beef

340

00:18:54,950 --> 00:18:52,480

and it gets into the air circulation

341

00:18:56,870 --> 00:18:54,960

system and it makes its first stop in

342

00:18:59,990 --> 00:18:56,880

node three and so at first you're like

343

00:19:01,909 --> 00:19:00,000

oh what is that oh wait it's lunchtime

344

00:19:04,710 --> 00:19:01,919

and then it's a much better smell into

345

00:19:05,590 --> 00:19:04,720

your brain you know meal time in space

346

00:19:08,230 --> 00:19:05,600

is

347

00:19:10,870 --> 00:19:08,240

can be a lot of fun it's especially

348

00:19:12,870 --> 00:19:10,880

dinner time at the end of this long day

349

00:19:15,270 --> 00:19:12,880

where six people

350

00:19:18,870 --> 00:19:15,280

six little pink bodies in space working

351

00:19:21,110 --> 00:19:18,880

all day long and we're rarely together

352

00:19:23,430 --> 00:19:21,120

working unless it's something

353

00:19:25,909 --> 00:19:23,440

very unique we're all off doing our own

354

00:19:27,830 --> 00:19:25,919

thing and to come together at the end of

355

00:19:30,230 --> 00:19:27,840

the day when you know that you've signed

356

00:19:31,510 --> 00:19:30,240

off with mission control

357

00:19:33,750 --> 00:19:31,520

and you're

358

00:19:35,669 --> 00:19:33,760

in that evening period of time that you

359

00:19:38,549 --> 00:19:35,679

can sit around a table with your

360

00:19:40,310 --> 00:19:38,559

crewmates and share food and when you're

361

00:19:42,710 --> 00:19:40,320

an international crew

362

00:19:45,430 --> 00:19:42,720

and you have food from your russian your

363

00:19:46,870 --> 00:19:45,440

russian crewmates your japanese

364

00:19:48,710 --> 00:19:46,880

roommates well that's what we are

365

00:19:50,070 --> 00:19:48,720

crewmates when you have everybody coming

366

00:19:51,909 --> 00:19:50,080

together at the table to share their

367

00:19:56,150 --> 00:19:51,919

food that's one of the best parts about

368

00:19:59,750 --> 00:19:57,590

so i just finished eating and i have to

369

00:20:01,669 --> 00:19:59,760

enter in

370

00:20:03,669 --> 00:20:01,679

what i ate because the ground folks like

371

00:20:08,950 --> 00:20:03,679

to keep track of it

372

00:20:11,510 --> 00:20:10,149

calories

373

00:20:13,430 --> 00:20:11,520

how much salt we're getting how much

374

00:20:15,110 --> 00:20:13,440

protein things like that they track us

375

00:20:16,470 --> 00:20:15,120

closely on everything when we lift

376

00:20:18,950 --> 00:20:16,480

weights we have to keep track of how

377

00:20:20,549 --> 00:20:18,960

much weight we lift how many reps we do

378

00:20:22,470 --> 00:20:20,559

when we run on the treadmill and

379

00:20:24,310 --> 00:20:22,480

computers are recording our heart rate

380

00:20:25,909 --> 00:20:24,320

when we turn on lights when we turn on

381

00:20:27,270 --> 00:20:25,919

the toilets

382

00:20:29,270 --> 00:20:27,280

i learned on my first mission there are

383

00:20:31,190 --> 00:20:29,280

no secrets in space

384

00:20:33,590 --> 00:20:31,200

and we got video cameras and just about

385

00:20:34,390 --> 00:20:33,600

all the modules

386

00:20:35,510 --> 00:20:34,400

so

387

00:20:36,789 --> 00:20:35,520

it's basically like being in a big

388

00:20:38,470 --> 00:20:36,799

fishbowl the ground knows everything

389

00:20:40,390 --> 00:20:38,480

about us up here

390

00:20:42,470 --> 00:20:40,400

which is not that big a deal but it's

391

00:21:00,630 --> 00:20:42,480

something to keep in mind

392

00:21:05,510 --> 00:21:02,149

we also just get my safety cutter on the

393

00:21:07,830 --> 00:21:05,520

other side of my idea back here

394

00:21:11,830 --> 00:21:07,840

can't be terry

395

00:21:14,870 --> 00:21:13,430

absolutely yeah

396

00:21:18,070 --> 00:21:14,880

it's just like in the pool instead of

397

00:21:21,669 --> 00:21:18,080

that with the exception of that big down

398

00:21:21,679 --> 00:21:30,149

exactly

399

00:21:33,830 --> 00:21:32,149

as the international space station flies

400

00:21:36,870 --> 00:21:33,840

257

401
00:21:39,110 --> 00:21:36,880
statute miles over the coast of chile

402
00:21:44,789 --> 00:21:39,120
terry virts and the initial moments of

403
00:21:49,110 --> 00:21:46,789
welcome back and thanks for watching

404
00:21:51,830 --> 00:21:49,120
this episode of station life as you can

405
00:21:53,669 --> 00:21:51,840
see space station nutrition research is

406
00:21:55,830 --> 00:21:53,679
vital towards improving the quality of

407
00:21:58,390 --> 00:21:55,840
human health and well-being

408
00:22:00,789 --> 00:21:58,400
in space and here on earth

409
00:22:03,510 --> 00:22:00,799
nasa is constantly searching for ways to

410
00:22:05,110 --> 00:22:03,520
benefit humanity as together we take the

411
00:22:07,270 --> 00:22:05,120
next steps towards exploring our

412
00:22:09,270 --> 00:22:07,280
universe searching for the answers that

413
00:22:11,430 --> 00:22:09,280

matter to us the most

414

00:22:12,950 --> 00:22:11,440

thank you for joining us on station life

415

00:22:14,549 --> 00:22:12,960

and our behind the scenes look at

416

00:22:16,549 --> 00:22:14,559

nutrition research aboard the

417

00:22:18,630 --> 00:22:16,559

international space station

418

00:22:20,549 --> 00:22:18,640

be sure to stay in touch and follow us

419

00:22:22,630 --> 00:22:20,559

on facebook and twitter for the latest

420

00:22:25,669 --> 00:22:22,640

research news and don't forget to

421

00:22:26,950 --> 00:22:25,679

download our fabulous app on your mobile

422

00:22:29,750 --> 00:22:26,960

device

423

00:22:33,430 --> 00:22:29,760

until next time stay with us off the