
SPEED
LIMIT
17500
28000
km/h

1
00:00:07,349 --> 00:00:05,190
whether it's losing weight or just

2
00:00:09,190 --> 00:00:07,359
making better choices we all get that

3
00:00:11,589 --> 00:00:09,200
first of the year boost when it comes to

4
00:00:13,110 --> 00:00:11,599
nutrition and getting healthy but for

5
00:00:15,509 --> 00:00:13,120
astronauts on the international space

6
00:00:17,189 --> 00:00:15,519
station it's a daily routine they have

7
00:00:19,349 --> 00:00:17,199
to think about everything they eat and

8
00:00:21,750 --> 00:00:19,359
how it will affect their overall health

9
00:00:23,029 --> 00:00:21,760
so we study nutrition in space and the

10
00:00:24,790 --> 00:00:23,039
things we're learning from these

11
00:00:27,109 --> 00:00:24,800
astronaut studies are shedding light on

12
00:00:29,589 --> 00:00:27,119
problems we face here on earth such as

13
00:00:31,349 --> 00:00:29,599

vision bone loss and vitamin d

14
00:00:34,150 --> 00:00:31,359
deficiencies what we're doing is trying

15
00:00:35,750 --> 00:00:34,160
to evaluate nutrition and basic

16
00:00:37,350 --> 00:00:35,760
physiology if you will

17
00:00:38,389 --> 00:00:37,360
in astronauts while they're on space

18
00:00:41,030 --> 00:00:38,399
station

19
00:00:42,229 --> 00:00:41,040
and it's very similar to

20
00:00:43,830 --> 00:00:42,239
when you go to the doctor and you get a

21
00:00:45,270 --> 00:00:43,840
checkup

22
00:00:47,190 --> 00:00:45,280
they'll draw a blood sample they'll

23
00:00:48,709 --> 00:00:47,200
collect the urine sample

24
00:00:50,150 --> 00:00:48,719
and we'll look at things in there to see

25
00:00:51,590 --> 00:00:50,160
how you're doing

26
00:00:54,150 --> 00:00:51,600
that's in essence what we're doing with

27
00:00:56,470 --> 00:00:54,160
it with a cruise we collect blood and

28
00:00:57,990 --> 00:00:56,480
urine samples during space flight

29
00:01:00,470 --> 00:00:58,000
over the course of a six-month mission

30
00:01:02,069 --> 00:01:00,480
we collect five blood samples and five

31
00:01:03,349 --> 00:01:02,079
urine samples

32
00:01:05,590 --> 00:01:03,359
and we measure

33
00:01:06,789 --> 00:01:05,600
a whole host of things in those samples

34
00:01:09,190 --> 00:01:06,799
to look at

35
00:01:10,950 --> 00:01:09,200
vitamin status and mineral status

36
00:01:13,109 --> 00:01:10,960
we look at things like bone metabolism

37
00:01:15,030 --> 00:01:13,119
we look at some muscle markers some

38
00:01:16,789 --> 00:01:15,040

oxidative damage markers

39
00:01:18,149 --> 00:01:16,799
you name it there's a lot of a lot of

40
00:01:20,550 --> 00:01:18,159
biochemistry in that blood urine that

41
00:01:23,270 --> 00:01:20,560
can tell us how your body's doing

42
00:01:24,710 --> 00:01:23,280
in our case during space flight

43
00:01:26,789 --> 00:01:24,720
we're looking at different chemicals

44
00:01:28,469 --> 00:01:26,799
that

45
00:01:30,870 --> 00:01:28,479
have helped us better understand some of

46
00:01:32,149 --> 00:01:30,880
the the medical issues that occur during

47
00:01:34,230 --> 00:01:32,159
spaceflight

48
00:01:35,510 --> 00:01:34,240
and the most significant one of those is

49
00:01:36,950 --> 00:01:35,520
we found

50
00:01:38,789 --> 00:01:36,960
crew members coming back from space

51
00:01:41,429 --> 00:01:38,799
station with vision problems

52
00:01:44,230 --> 00:01:41,439
crew members that went up with perfect

53
00:01:47,510 --> 00:01:44,240
vision and came home needing glasses

54
00:01:50,230 --> 00:01:47,520
in the in its simplest explanation and

55
00:01:53,190 --> 00:01:50,240
what we found in data from uh blood

56
00:01:56,310 --> 00:01:53,200
samples is that there are differences in

57
00:01:57,830 --> 00:01:56,320
the biochemical profiles of crew members

58
00:01:59,270 --> 00:01:57,840
that had vision issues compared to those

59
00:02:00,870 --> 00:01:59,280
that did not

60
00:02:02,950 --> 00:02:00,880
and were working to follow up on that to

61
00:02:05,030 --> 00:02:02,960
try to help better understand

62
00:02:07,429 --> 00:02:05,040
the vision changes during flight

63
00:02:10,469 --> 00:02:07,439

the research they were doing in flight

64
00:02:12,710 --> 00:02:10,479
from from two perspectives um has a lot

65
00:02:15,430 --> 00:02:12,720
to do with people on earth

66
00:02:17,990 --> 00:02:15,440
just understanding basic physiology uh

67
00:02:19,990 --> 00:02:18,000
basic nutritional requirements um can

68
00:02:22,630 --> 00:02:20,000
help us better understand

69
00:02:23,990 --> 00:02:22,640
those same things on earth the bone loss

70
00:02:26,150 --> 00:02:24,000
that we see during space flight is very

71
00:02:27,910 --> 00:02:26,160
similar to some bone diseases that

72
00:02:29,589 --> 00:02:27,920
people on earth get

73
00:02:32,070 --> 00:02:29,599
and we're studying them in a very

74
00:02:34,309 --> 00:02:32,080
healthy population so

75
00:02:36,229 --> 00:02:34,319
that helps us better understand

76
00:02:38,630 --> 00:02:36,239
the nature of those diseases and then on

77
00:02:40,869 --> 00:02:38,640
the other hand as we develop means to

78
00:02:43,270 --> 00:02:40,879
help counteract those diseases or those

79
00:02:45,830 --> 00:02:43,280
issues during space flight

80
00:02:48,150 --> 00:02:45,840
those two have direct application uh for

81
00:02:50,150 --> 00:02:48,160
people on earth be it dietary changes

82
00:02:51,350 --> 00:02:50,160
that can help mitigate bone loss during

83
00:02:52,790 --> 00:02:51,360
flight

84
00:02:54,150 --> 00:02:52,800
one of the things is that you know we

85
00:02:55,830 --> 00:02:54,160
did some studies

86
00:02:57,509 --> 00:02:55,840
to help better understand how much

87
00:02:58,390 --> 00:02:57,519
vitamin d people needed during space

88
00:03:00,550 --> 00:02:58,400

flight

89
00:03:02,710 --> 00:03:00,560
and we've now got a point where where

90
00:03:05,110 --> 00:03:02,720
we're maintaining vitamin d levels in

91
00:03:07,830 --> 00:03:05,120
our astronauts those data were actually

92
00:03:10,070 --> 00:03:07,840
incorporated in the group the the

93
00:03:12,149 --> 00:03:10,080
institute of medicine who sets the

94
00:03:14,470 --> 00:03:12,159
recommended dietary allowances the rdas

95
00:03:16,869 --> 00:03:14,480
for the population

96
00:03:18,710 --> 00:03:16,879
our study was one of the many studies

97
00:03:20,149 --> 00:03:18,720
that those groups looked at to help

98
00:03:21,750 --> 00:03:20,159
better understand

99
00:03:22,869 --> 00:03:21,760
vitamin d requirements for people on

100
00:03:24,470 --> 00:03:22,879
earth so

101
00:03:25,509 --> 00:03:24,480
there's a there's a lot of interaction

102
00:03:26,390 --> 00:03:25,519
but again

103
00:03:32,390 --> 00:03:26,400
um

104
00:03:34,789 --> 00:03:32,400
it it overlaps

105
00:03:37,190 --> 00:03:34,799
entirely we still have a lot of work to

106
00:03:39,670 --> 00:03:37,200
do based on the many findings that we've

107
00:03:41,350 --> 00:03:39,680
gotten out of our first nutrition study

108
00:03:42,550 --> 00:03:41,360
we've actually evolved that into a

109
00:03:45,430 --> 00:03:42,560
follow-on study what we're calling the

110
00:03:47,670 --> 00:03:45,440
biochemical profile experiment where

111
00:03:49,589 --> 00:03:47,680
again we're collecting

112
00:03:51,589 --> 00:03:49,599
blood and urine samples to look at the

113
00:03:53,910 --> 00:03:51,599

adaptation of space flight

114
00:03:54,789 --> 00:03:53,920
we're also starting up

115
00:03:56,229 --> 00:03:54,799
some

116
00:03:58,229 --> 00:03:56,239
what we call the integrated nutrition

117
00:03:59,910 --> 00:03:58,239
study where we're looking to modify

118
00:04:02,390 --> 00:03:59,920
people's diets to provide healthier

119
00:04:04,390 --> 00:04:02,400
diets to see if we can use those as ways

120
00:04:06,309 --> 00:04:04,400
to mitigate some of the negative effects

121
00:04:08,229 --> 00:04:06,319
of space flight on the human body

122
00:04:09,509 --> 00:04:08,239
and those are in the very early stages

123
00:04:10,869 --> 00:04:09,519
but hopefully

124
00:04:12,309 --> 00:04:10,879
in a few years i'll be back talking