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Free-range reindeer consumption improves protein metabolism in humans

Submission date
24/04/2020

Recruitment status
No longer recruiting

Registration date
07/05/2020

Overall study status
Completed

Last Edited
05/05/2020

Condition category
Other

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data

Plain English summary of protocol

Background and study aims
Alaska's Indigenous people are growing in number, especially the elderly sector. These groups experience greater functional disabilities throughout life than other populations. In Alaska, the reasons for the disability gap are complicated. Limited economic competition, higher profit margins, expensive medical frameworks, and unique environmental, social, and demographic elements all contribute to the difficulties. Such problems create the most extreme healthcare costs in the United States, 2.5 times the national average. Instead of addressing these challenges after individuals reach the older stages of life, planning for healthy aging over a lifetime is needed to offset the risks of muscle loss, disability, and rising healthcare costs. Taking a critical look at traditional food intake is becoming more important as an attempt to hold off increasing health risks in Indigenous populations.

It is not known how free-range wild game of the Alaska Native traditional foods might affect sarcopenia, which is the age-related loss of lean tissue mass, strength, and function. Muscle, made up of proteins, is in a constant state of turnover; building up and breaking down. Whole-body protein synthesis (PS) and protein breakdown (PB) are always occurring. A healthy, steady state of lean tissue mass is a result of adequate diet and/or physical activity. Both have declined dramatically and quickly in the Alaska Indigenous population, while migration from traditional lifestyles and food consumption has also taken place. For PS to occur as a result of nutrient intake, essential amino acids (EAA's) must be present in sufficient amounts. The wild game of the Alaska Native traditional diet provides proteins with EAA's that are necessary for PS to be greater than PB, and create a higher net balance of protein (NB).

Hypothesis: NB will be higher in FR compared to CB; due to existing differences in the total amount of protein in FR.

Study Aim #1: to compare the feeding-induced response of equivalent amounts of free-range reindeer (FR) and commercial beef (CB) on protein metabolism using stable isotope methodology.

Who can participate?
Males and females of any ethnic background, between the ages of 20 and 70 years with a BMI of

20-28 were considered. Volunteers with a pacemaker, diabetes, or chronic inflammatory condition will not be accepted. Volunteers taking any type of medication or supplement could affect glucose metabolism cannot participate. Those with active cancer, taking corticosteroids by mouth, injection, or trans-dermally are not eligible. If the study physician recognizes any other disease that would place them at increased risk, those volunteers would not be accepted.

What does the study involve?

What are the possible benefits and risks of participating?
Study participants acquire knowledge about their health, including body composition, lipid profiles, and protein responses to reindeer and ground beef.

Where is the study run from?
Clinical Research and Imaging Facility, Alaska (USA)

When is the study starting and how long is it expected to run for?
May 2017 to June 2019

Who is funding the study?
The National Institute of General Medical Sciences of the National Institutes of Health (NIH) under award numbers UL1GM118991, TL4GM118992, or RL5GM118990 and an Institutional Development Award under grant number P20GM130443

Who is the main contact?
Dr Robert Coker, rcoker@alaska.edu

Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
IRBnet 749396

Study information

Scientific Title
Ingestion of free-range reindeer promotes higher net protein balance compared to commercial beef

Acronym
FRCB

Study objectives
Ingestion of 2 ounces of free-range reindeer will promote greater whole-body protein net balance than 2 ounces of commercial beef.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 05/04/2017, University of Alaska Fairbanks Institutional Review Board (PO Box 757270, Fairbanks, AK 99775-7270;), ref: #749396

Study design
Interventional randomized cross over trial

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Healthy Individuals

Interventions
The acute response to ingestion of 2 oz of free-range reindeer meat compared to 2 oz of commercial beef was evaluated using a randomized, crossover experimental design and stable isotope methodology in healthy male and female participants.

Participants ingested reindeer or commercial beef in conjunction with isotopic tracer infusions of phenylalanine and tyrosine. Whole-body protein synthesis, protein breakdown and net protein balance were determined using the isotopic enrichments of phenylalanine and tyrosine as measured by gas chromatography-mass spectrometry. Amino acid concentrations were measured by liquid chromatography-electrospray ionization-mass spectrometry.

Intervention Type
Other

Primary outcome(s)
Whole-body protein synthesis, protein breakdown and protein balance measured using the isotopic enrichments of phenylalanine and tyrosine as measured by gas chromatography-mass spectrometry over a seven-hour period

Key secondary outcome(s))
Plasma essential amino acids concentration measured using by liquid chromatography-electrospray ionization-mass spectrometry over a seven-hour period

Completion date
04/06/2019

Eligibility

Key inclusion criteria
1. Aged 20 - 70 years
2. BMI range of 20-38 kg/m²

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Mixed

Sex
All

Total final enrolment
8

Key exclusion criteria
1. Have a pacemaker
2. Previously diagnosed diabetes
3. Chronic inflammatory condition
4. Taking any type of medication or supplement that may affect glucose metabolism
5. Active cancer or malignancy
6. Taking corticosteroids by mouth, injection or trans-dermally
7. Females who test positively for pregnancy
8. Any other disease that would place them at increased risk of harm if they were to participate, at the discretion of the study physician

Date of first enrolment
04/05/2017

Date of final enrolment
11/05/2018

Locations

Countries of recruitment
United States of America

Study participating centre
Clinical Research and Imaging Facility
PO Box 75700
2140 Koyukuk Drive
Fairbanks
United States of America
99775-7000

Sponsor information

Organisation
National Institutes of Health

ROR
https://ror.org/01cwqze88

Funder(s)

Funder type
Government

Funder Name
National Institutes of Health

Alternative Name(s)
US National Institutes of Health, Institutos Nacionales de la Salud, NIH, USNIH

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United States of America

Results and Publications

Individual participant data (IPD) sharing plan

Tthe datasets during and/or analyzed during the current study are/will be available upon request for a period of at least 5 years. Please contact Robert Coker at rcoker@alaska.edu and /or 907 474-6701 for electronic data and data analysis and/or information regarding participant consent and institutional review board documentation.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/04/2020	27/04/2020	Yes	No