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Division of Diabetes Treatment and Prevention
Advancements in Diabetes Seminar
December 3, 2013

Alaskan Natives are the Healthiest People in the World



Time of Contact for Alaska Native Groups

- Aleut/Unangan 1740-1780
- Alutiiq 1740-1780
- Yup'ik 1780-1840
- Inupiaq 1850-1870
- Tlingit/Haida/Tsimshian 1840-1860
(Interior)
- Tlingit/Haida/Tsimshian 1775-1800
(Coast)

Dietary Variation b/t Region

Pre-contact:

- High, healthy protein diet
- High, healthy fat diet
- Low in Carbohydrates

Dietary Changes: 1950s

- Local source of carbohydrates ranged from 20 – 45%
- Portion consumed as candy and pop ranged from 15 – 32%
- In Adults: 1/3rd of daily calories were from bread, cereal, grain products

Dietary Changes: 1980s

1989: Statewide survey doing 24-hour dietary recall from Alaska Native people

On average:

	MEN	WOMEN
Protein	19%	18%
Fat	38%	37%
Carbs	41%	44%

A Changing Picture...



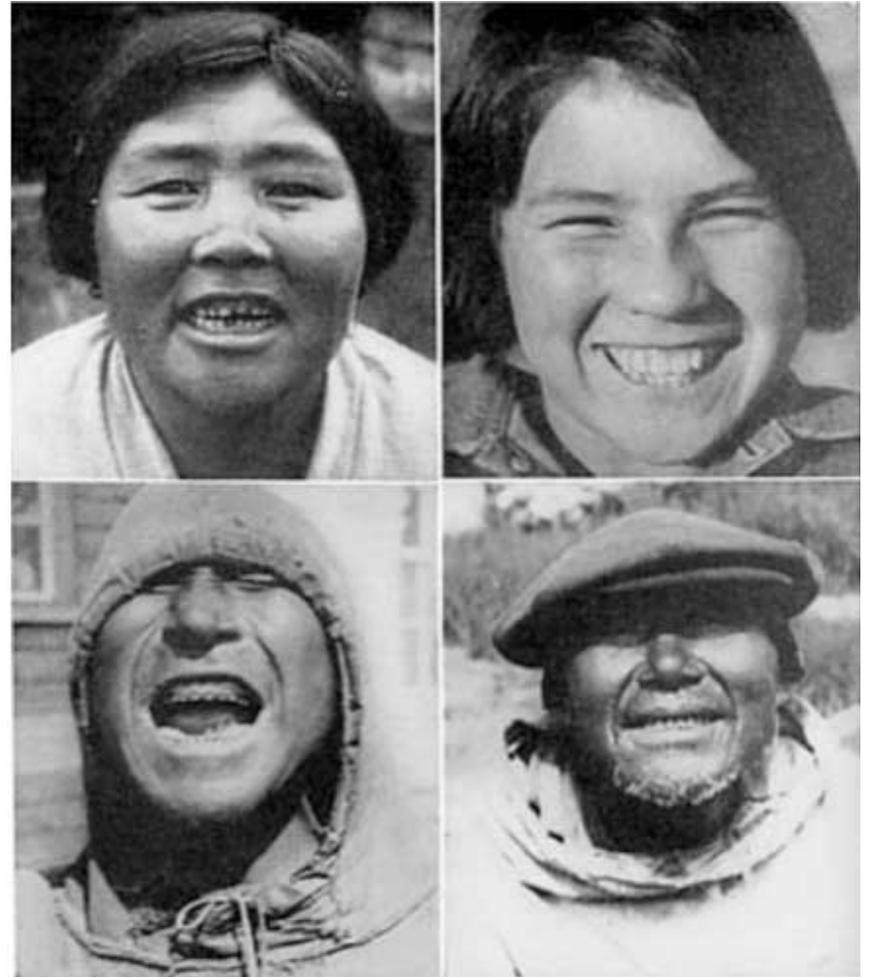


Weston Price



1933...Traveled to Remote Alaskan Villages

- ...examples of physical excellence and dental perfection such as has seldom been excelled by any race in the past or present.



“...strong rugged babies”



Virtually NO Dental Decay, Until...



- ...villages with trading posts... “store grub” ...
- “A typical effect of modernization on a growing girl was shown in a case in which the central incisors and 16 other teeth were attacked by dental caries. Sixty-four percent of her teeth had tooth decay.”

1st Generation of Children Born After Adoption of 'Store Grub'

- Dental arch deformities
- Crooked Teeth
- Changed facial form

“We have few problems more urgent
or more challenging
than reversing these trends.”

Weston A. Price, 1933



Pottenger's Cats



POTTENGER'S CATS

A Study In Nutrition

By Francis M. Pottenger, Jr., M.D.

10 year nutritional study

Cats on optimal cat diet:
(raw meat, raw milk) thrived- 4
generations later still healthy-

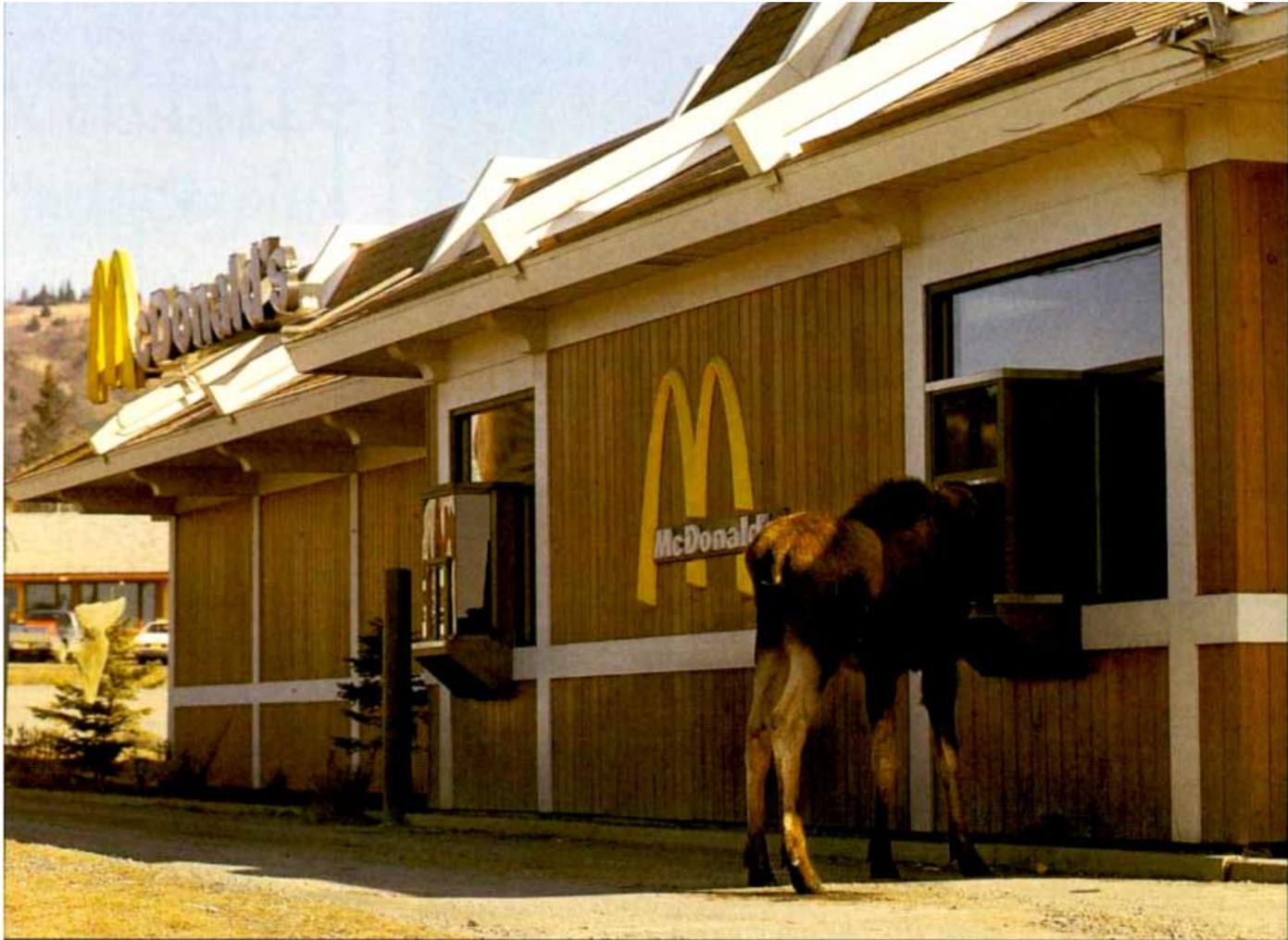
Processed diet (canned milk,
condensed milk, cooked meats):

1st gen- sick older age

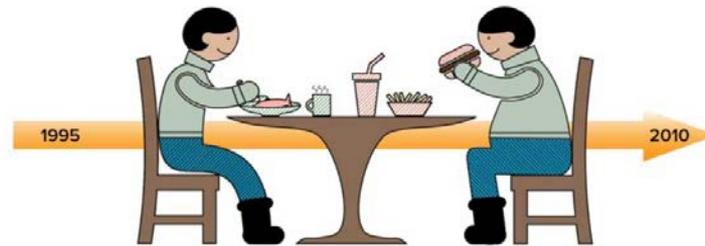
2nd gen- sick middle age

3rd gen- sick from birth, behavior
problems

4th gen- NO 4th generation- sterile
or aborted fetuses



136% increase in diabetes in Alaska Native people.⁽²⁾

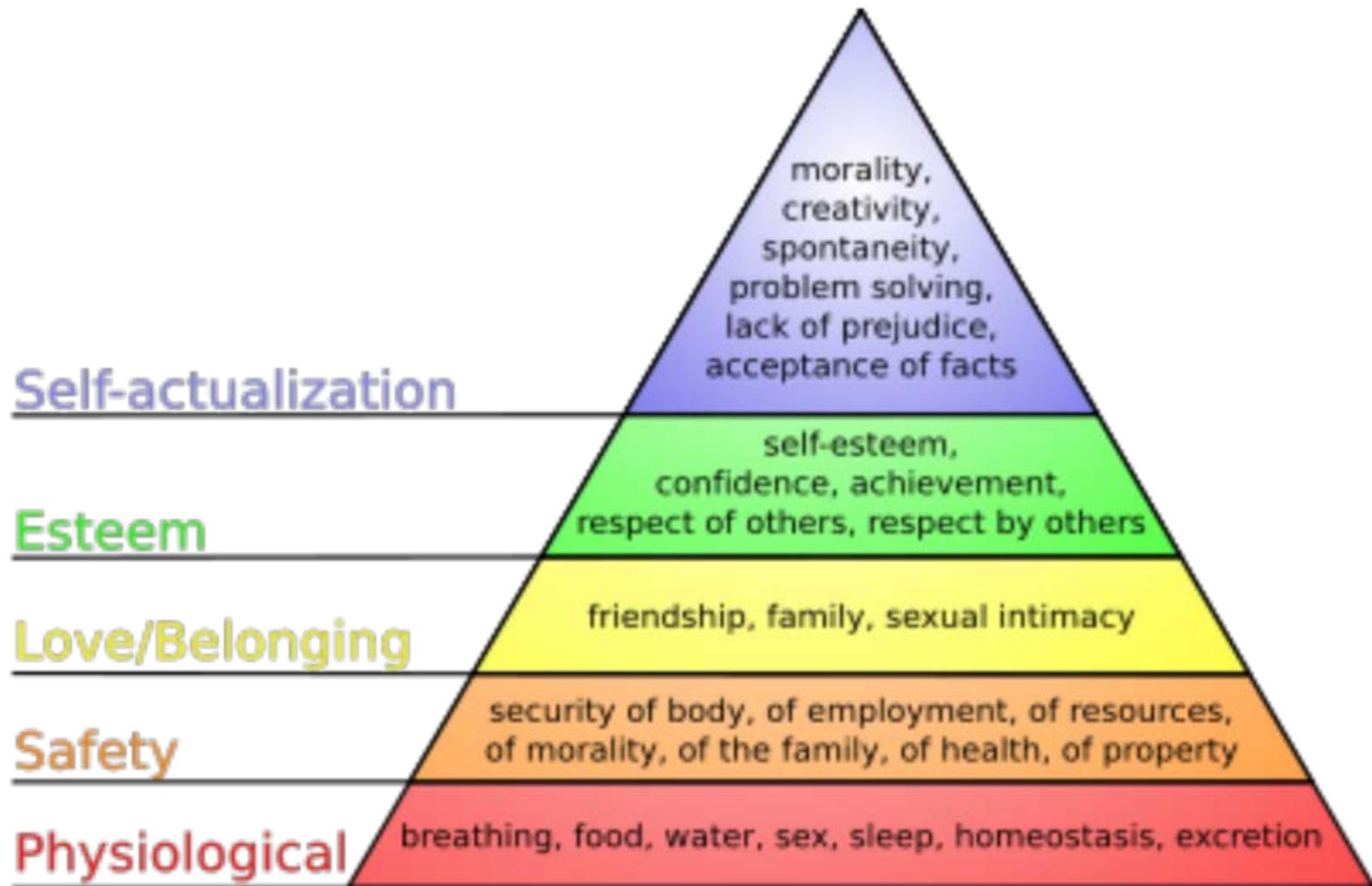


“First, remove obstacle to
cure”









Vis Medicatrix Nature



“Let food be your medicine”
-Hippocrates





TRADITIONAL VALUES OF ALASKA

SANCTI LAWRENCE ISLAND YUPIK VALUES

- Listen with your heart and mind
- Honor Family
- Give Service to others
- Never give up
- Respect all living things
- Remember advice of elders
- Plan for the future
- Be independent
- Avoid laziness
- Gather knowledge and wisdom

CUPIK VALUES

- Help other people
- Help with family chores and needs
- Early to bed and early to rise
- Possible time to see how your life is going
- There's always time to play AFTER your work is done
- *Ukpaq* means to do things yourself
- Respect and honor your elders
- Always show good behavior
- Listen to all advice given to you
- Remember what you are taught and told
- Respect other people's belongings
- Respect the animals you catch for food
- Gather knowledge and wisdom from the elders
- Never give up or trying to do what you set your mind on

BRITISH BAY YUPIK VALUES

- Have respect for our land and its resources at all times
- Be helpful to one another
- Share with others whenever possible
- Respect and care for other's property
- Respect spiritual values
- Learn hunting and outdoor survival skills
- Provide for and take good care of your family
- Through love, respect your children
- Respect your elders
- Work hard and don't be lazy
- Balance fun alcohol and drug use
- Learn, preserve, and be proud of the Native way of life

CHITKHALEK YUPIK VALUES

- *Ukpaq* - *Ukpaq* - *Ukpaq*
- *Ukpaq* - *Ukpaq* - *Ukpaq*

ATHABASCAN VALUES

- Self-sufficiency
- Hard Work
- Care and attention for the family

NORTHWEST ARCTIC DUTCHMAN VALUES

- Knowledge of Language
- Knowledge of Family Ties
- Sharing





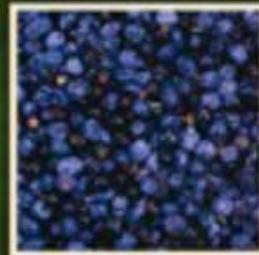




Store Outside?

Traditional Food Guide

FOR ALASKA NATIVE
CANCER SURVIVORS



Alaska Native Tribal Health Consortium
Cancer Program





Fiddlehead Fern

NATIVE NAMES: Cetuguar (Yup'ik)

Fiddlehead ferns are also known as the "trailing wood" fern. Fiddleheads are the coiled edible spring growth of ferns. They can be found from the Brooks Range southward toward the Aleutian Islands, and on the Alaska Panhandle. To harvest them, pick the tightly coiled fiddleheads in early spring. Fiddlehead fern rootstock can be harvested in early spring or fall.



Alaska Plant Materials Center

CAUTION: Pick fiddleheads only when they are young and tightly coiled, as the mature ferns are toxic.

PREPARATION: Fiddleheads should always be cooked before eating. The tighter the head the tastier it will be. Fiddleheads can be prepared by steaming, boiling, or baking. Before cooking fiddleheads, rub off the bitter brown chaff on the stalks and rinse them with water.

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"In the early spring one year, the people ran out of food. They divided into two groups, one moving into the higher country to dig ferns, and the other to the salt water to dig clams. Those people who lived on ferns received back their strength and gained weight, while those that lived on clams barely survived."

— Tanaina Plantlore

FIDDLEHEAD FERN NUTRITION INFORMATION

Fiddlehead ferns are an excellent source of fiber and Vitamin A, and a good source of Vitamin C



HEART FRIENDLY
 • Low in fat
 • Very low in sodium

NUTRITION INFORMATION	
Per serving - 1 cup, raw	
Calories	51
Protein	7 g
Carbohydrate	8 g
Fat	1 g
Calories from fat	11 %
Saturated fat	NT*
Dietary Fiber	6 g
Cholesterol	0
Sodium	2 mg
Vitamin A	542% DV
Vitamin C	40 mg
Iron	3 mg

*Not Tested

CAUTION: Pick fiddleheads only when they are young and tightly coiled, as the mature ferns are toxic.



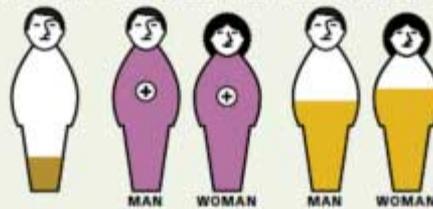


FIREWEED NUTRITION INFORMATION

Fireweed is an excellent source of Vitamins A & C, and a good source of fiber



FIBER VITAMIN A VITAMIN C



HEART FRIENDLY

- Fat free
- Very low in sodium

NUTRITION INFORMATION	
Per serving - 1 cup; raw	
Calories	24
Protein	2 g
Carbohydrate	3 g
Fat	0
Calories from fat	0 %
Saturated fat	NT*
Dietary Fiber	3 g
Cholesterol	NT*
Sodium	28 mg
Vitamin A	3146 IU
Vitamin C	55 mg
Iron	1 mg

*Not Tested



FOOD FROM THE SEA

Whale, Beluga, Bowhead

NATIVE NAMES:
Arveq (Yup'ik),
Talin (Dena'ina),
Yáay (Tlingit)



Donald Zanoff

For centuries whales were hunted for their valuable oil and very fine grained meat. Alaska Natives in the North continue to harvest whales as a source of food and fuel, as they have traditionally done for thousands of years.

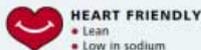
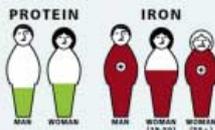
PREPARATION: Whale meat can be prepared by pan-broiling the square steaks and serving them sizzling hot. Whale meat is also excellent for soup stock, stews, roasts, and curries. Another way to enjoy whale is to eat the muktuk (the outer covering of the whale), which is traditionally eaten raw or cooked.

September brings whaling season to Kaktovik, a village-wide activity. Women prepare food to send out with the whaling crews and wait on the beach for the crews to return with a whale. The day after the whale is beached, everyone goes to the captain's house to eat whale meat and muktuk. They spend the whole day visiting and eating and then take some of the leftover whale meat home with them.
— Frances Lampe, Kaktovik

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WHALE NUTRITION INFORMATION

Whale is an excellent source of protein & iron



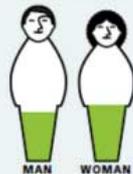
NUTRITION INFORMATION	
Per serving - 3 oz: cooked	
Calories	115
Protein	22 g
Carbohydrate	0
Fat	6 g
Calories from fat	48 %
Saturated fat	1 g
Dietary Fiber	0
Cholesterol	24 mg
Sodium	85 mg
Vitamin A	280 IU
Vitamin C	6 mg
Iron	12 mg

WHALE NUTRITION INFORMATION

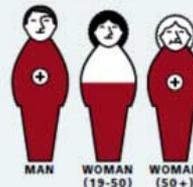
Whale is an excellent source of protein & iron



PROTEIN



IRON



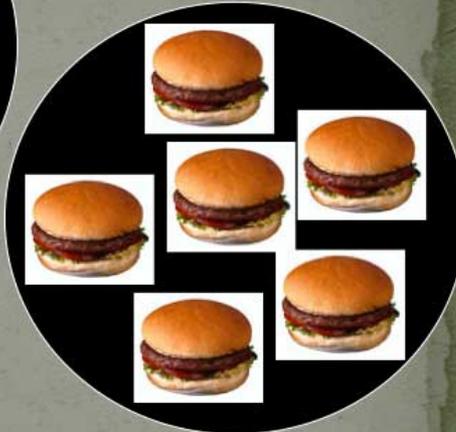
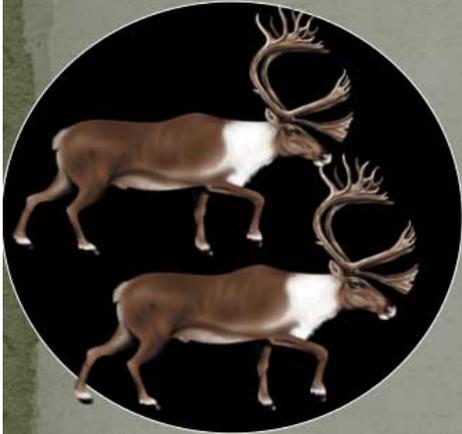
HEART FRIENDLY

- Lean
- Low in sodium

NUTRITION INFORMATION

Per serving - 3 oz: cooked	
Calories	115
Protein	22 g
Carbohydrate	0
Fat	6 g
Calories from fat	48 %
Saturated fat	1 g
Dietary Fiber	0
Cholesterol	24 mg
Sodium	85 mg
Vitamin A	280 IU
Vitamin C	6 mg
Iron	12 mg

IRON

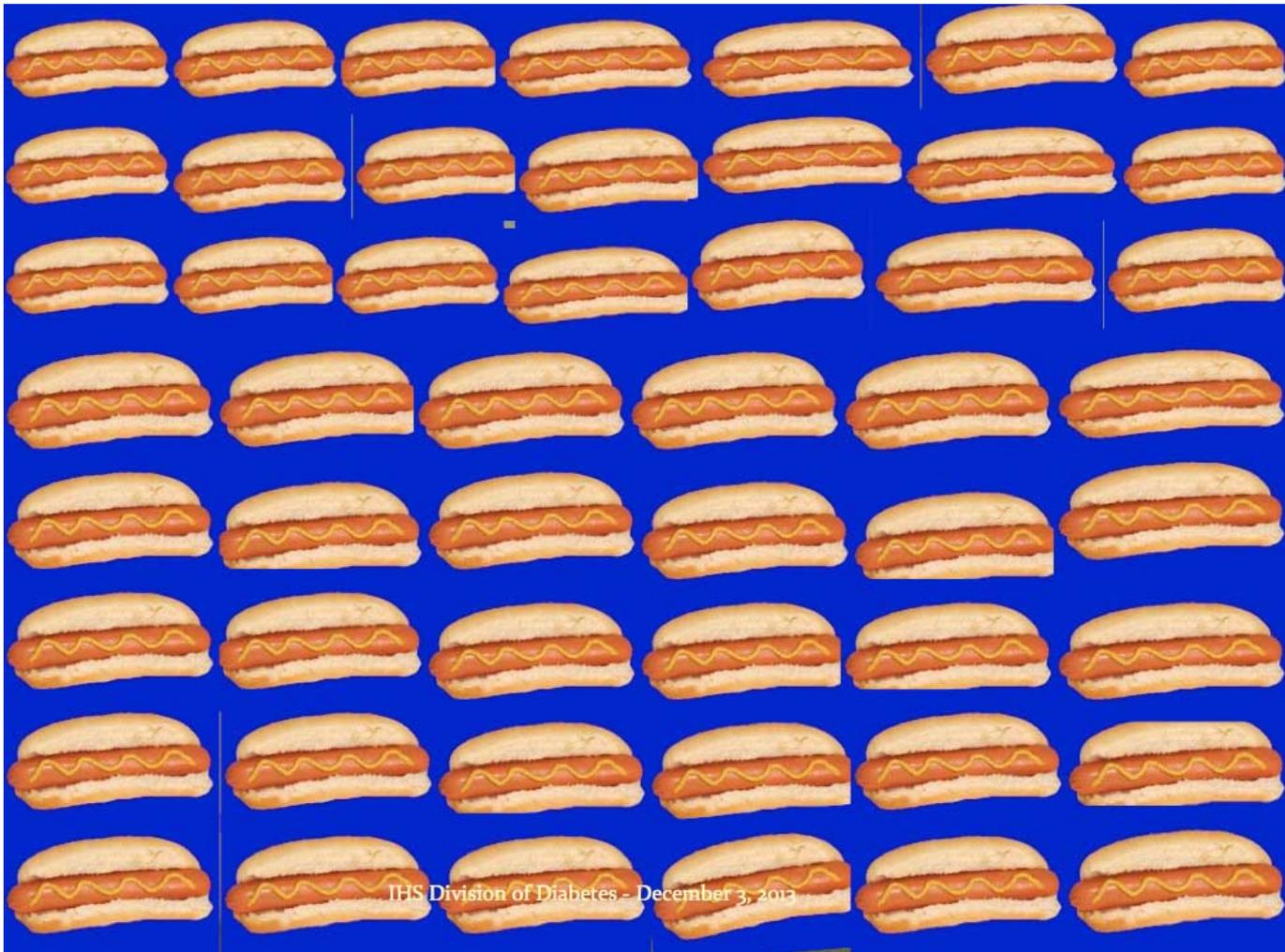


IRON....



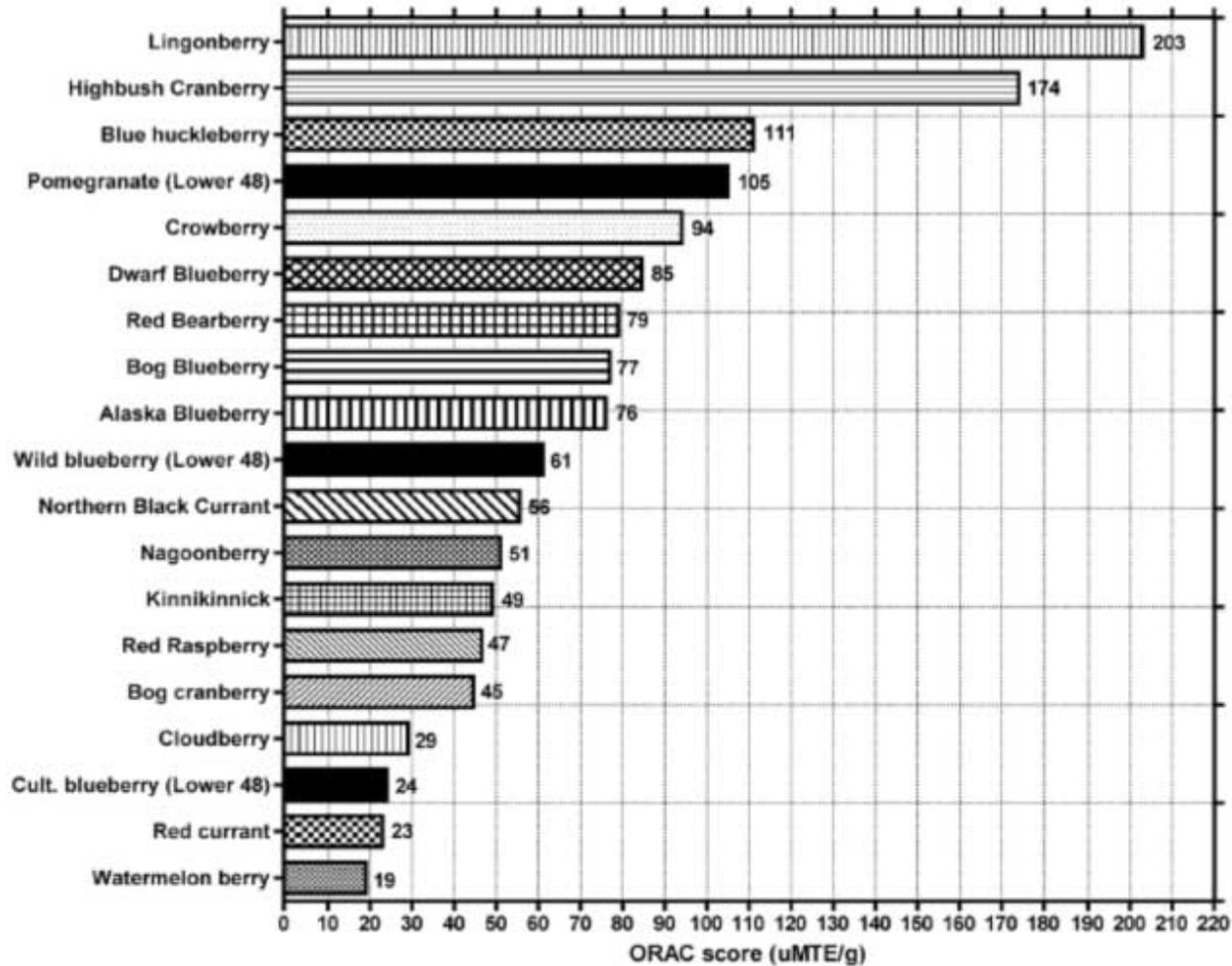
how many hotdogs?

Country food is good for you and your family





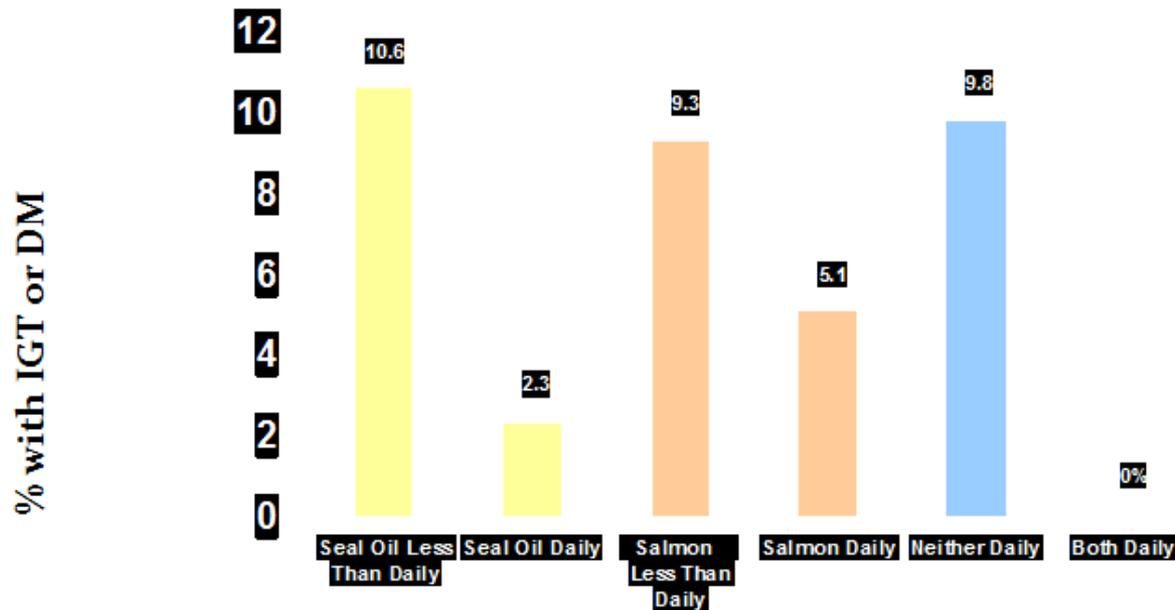
Comparison of Berries







The Effect of Seal Oil/Salmon on Glucose Intolerance



Glucose intolerance is less common among those who eat seal oil and/or salmon daily

Daily Consumption of Seal Oil or Salmon Associated with Lower Risk of Non-Insulin Dependent Diabetes Mellitus and Impaired Glucose Tolerance in Yup'ik Eskimos and Athabascan Indians in Alaska.
Circumpolar Health 1993:270-273.

Ulva lactuca (UL)
Sea lettuce



Saccharina latissima (SL)
Sugar wrack



Saccharina groenlandica (SG)
Kelp



Alaskan Seaweed



Pyropia fallax (PF)
False laver



Alaria marginata (AM)
Winged kelp



Fucus distichus (FD)
Bladderwrack

Antioxidant Activity

- Oxidative damage related to a number of chronic diseases
 - Obesity
 - Diabetes
 - Arthritis
- Cardiovascular disease
- Preventing oxidants can slow or reverse damage to tissue
- Treat macrophage cells to determine effects on blocking oxidants

Most active species:

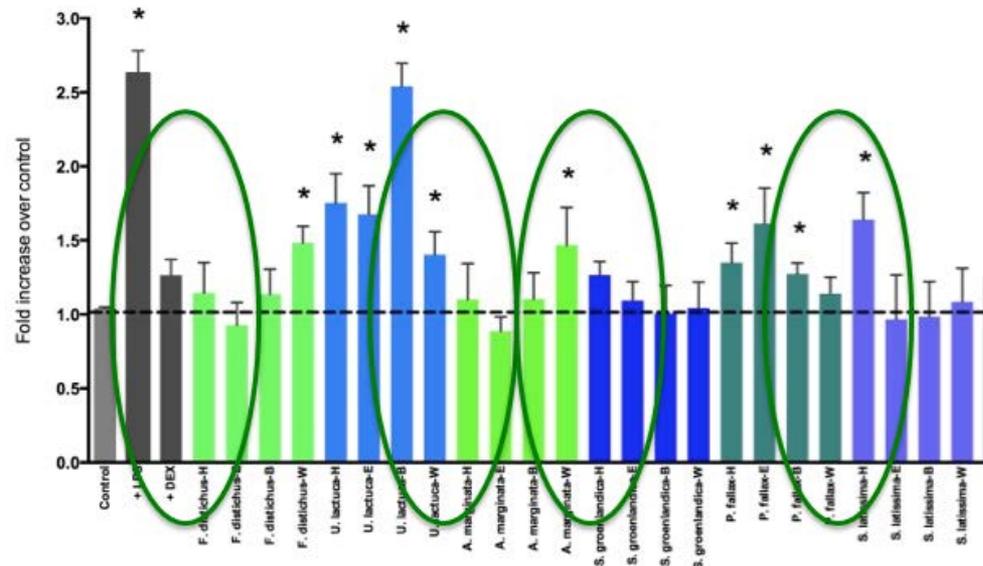
Brown kelps:

F. distichus – bladder wrack

A. Marginata – ribbon kelp

S. groenlandica – kelp

S. Latissima – surgar wrack



Lipase Inhibitory Activity

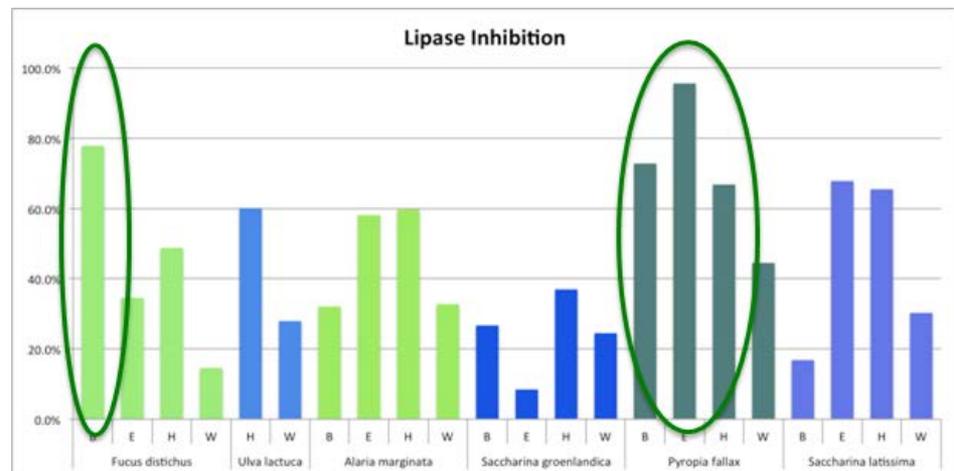
- Lipases are enzymes that digest fat from the diet
 - Our lipases are more active than the amount of lipids we consume
 - Increasing fat in the diet means it is just as easily broken down and digested
- Main source of circulating lipids in the blood stream
- Blocking lipase can help lower lipid digestion
 - Decrease obesity (Orlistat)

Most active species:

Brown and red kelps:

F. distichus – bladder wrack

P. Fallax – false laver



Glucosidase Inhibitory Activity

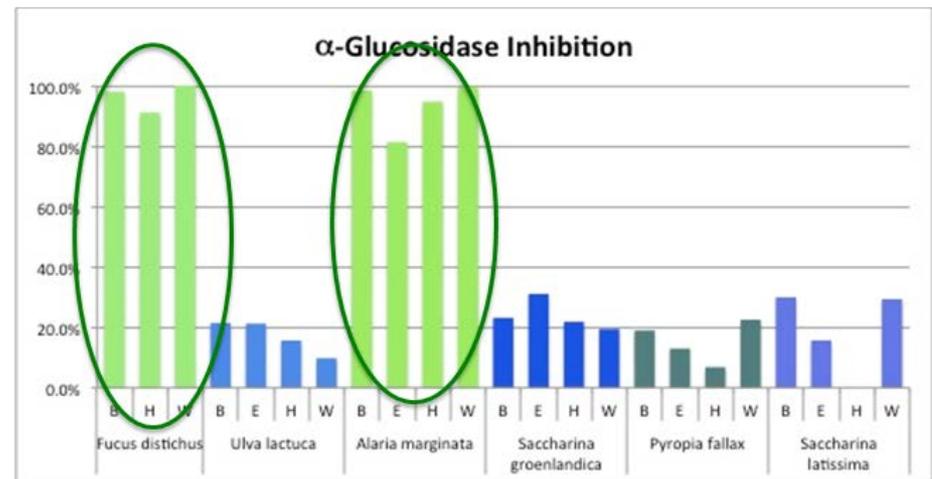
- Glucosidases breakdown starch to sugar
 - We contain a variety of related enzymes in our digestive system
- Main source of circulating sugars in the blood stream
- Blocking can help lower glucose metabolism and digestion
 - Decrease glucose levels internally
 - Lower insulin stress, decrease insulin resistance

Most active species:

Brown kelps:

F. distichus – bladder wracker

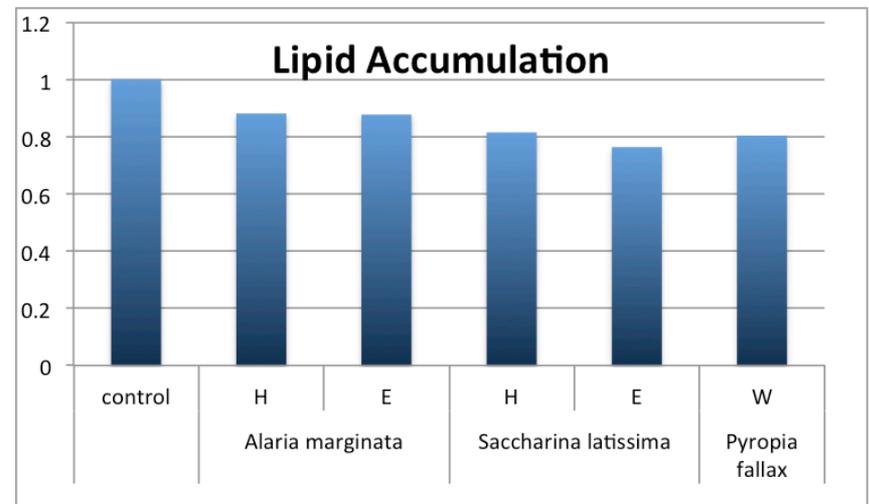
A. Marginata – ribbon kelp



Decrease in Lipid Accumulation

- Fat cells synthesize and accumulate lipids from the bloodstream
 - Grow larger to accommodate all the lipids, leading to obesity
- High accumulation levels also increases inflammation, can lead to diabetes
- Lower levels can help lower obesity risk
 - Decrease lipids circulating in bloodstream
 - Lower inflammation and insulin resistance

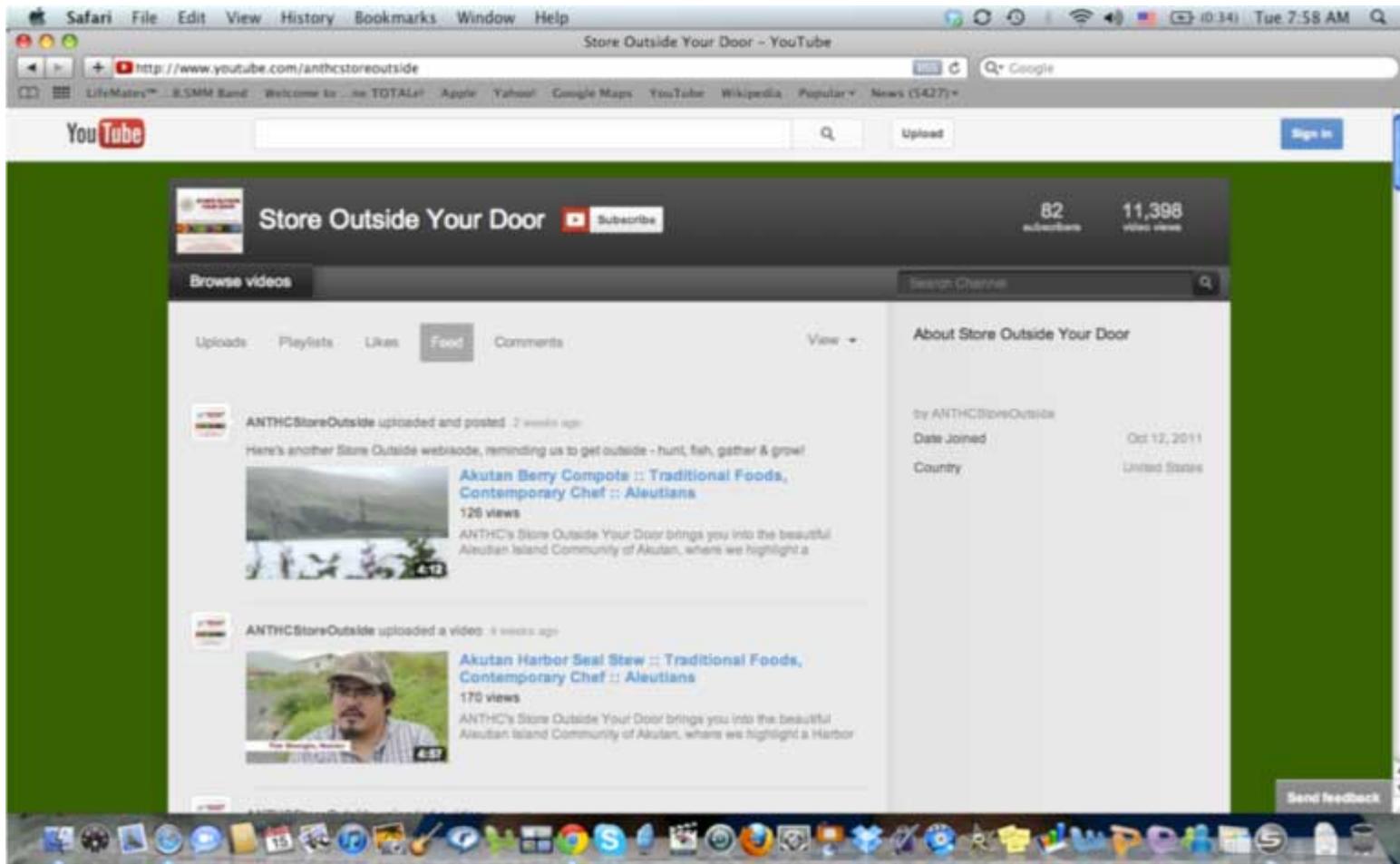
Fraction from *A. marginata* (ribbon kelp) and *S. latissima* (sugar wrack) and *P. fallax* (false laver) all decreased fact accumulation in cells by as much as 24%.



Conclusion and Next Steps

- Seaweed from Alaska have potential to offset complications of obesity and diabetes
 - Reduce oxidative damage
 - Inhibit digestion of certain dietary nutrients
 - Glucosidase
 - Lipase
 - Reduce accumulation of lipids in fat cells
- From here to the future
 - Determine active chemicals
 - Elucidate mechanisms of action
 - Investigate clinical and dietary interventions at the community level













Safari File Edit View History Bookmarks Window Help (9) Store Outside Your Door

https://www.facebook.com/StoreOutside/?sk=page_insights§ion=navPeople

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Your Fans People Reached **People Engaged**

The people who have liked, commented, or shared your posts in the past 28 days.

Women
 77% People Engaged 75% Your Fans

Men
 21% People Engaged 24% Your Fans

Age Group	Women Engaged (%)	Women Fans (%)	Men Engaged (%)	Men Fans (%)
13-17	0.3%	0.1%	0.1%	0.1%
18-24	2%	1%	1%	1%
25-34	15%	3%	3%	3%
35-44	19%	5%	5%	5%
45-54	17%	8%	8%	8%
55-64	14%	4%	4%	4%
65+	9%	2%	2%	2%

Country	People Engaged	City	People Engaged	Language	People Engaged
United States of America	1,100	Anchorage, AK	287	English (US)	1,057
Canada	27	Juneau, AK	40	English (UK)	82
Norway	5	Wasilla, AK	36	Norwegian (Bokmal)	4
Russia	4	Fairbanks, AK	34	Russian	3
Denmark	3	Sitka, AK	27	French (France)	3
Australia	3	Ketchikan, AK	25	English (Pirate)	2

Slide 75 of 80 84%

Traditional Infant Feeding Guide





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