

“Beans Go Viral”: Building Blocks for Making the Desire For Beans Infectious!

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RE: Segment on 9News

Thompson, Henry

Sent: Thu 7/18/2019 10:21 AM

To: Colleen Ferreira

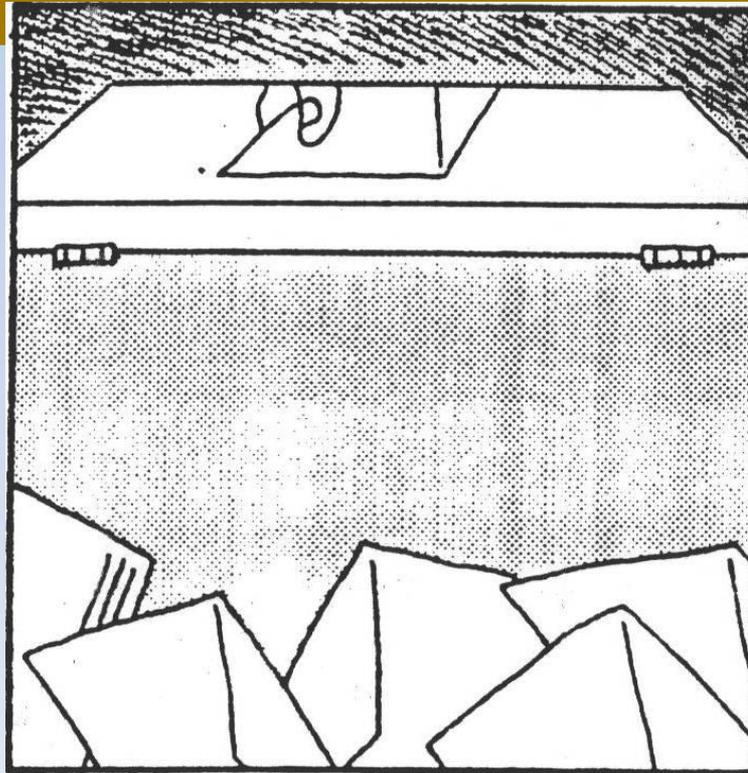
Colleen Ferreira, Executive Director

Colorado Chefs Association, American Culinary Federation

- Hi Colleen, I'm filming my on-line course in Food Pharmacology and Human Health in August and I have studio time at CSU from 8 to 1 that day....Bob's email suggested that the segment might be pre-filmed...but given it's a live shoot, it might be tricky to get the timing to work...hence, the rapidity of my response. **Colleen, I constantly reflect on what it will take to make pulse consumption "go viral" ...I have no answer, but I think what you are doing is important...things will stay as they are (limited pulse consumption), unless people affiliated with your association become champions...first and foremost...people want to eat tasty cuisines that are affordable....I think that if I challenged a chef to take 3 cups of cooked pulses (bean, dry pea, chickpea and lentil) distributed throughout the day, that they would come up with recipes/meals/menus that would result in an exciting, tasty, and affordable cuisine...and yes, it would also be extremely healthy (a secondary benefit)...so, consider your association challenged!!!** cheers, henry

Let's build your tool kit

What is the future of beans in health & wellness?



- **Water is wet.**
- **Fire is hot.**
- **Eating beans is good for you.**

Examples of some of the irrefutable truths we learn from an early age, and never think to question. ...???

Sure, you'll be hard pressed to find dry water or a cold flame, but eating beans?

Let's Start With Our Destination
The Perceptions You Project



**The search for the winning
“anchor-twist”**



Andean Diversity Panel



Photo: Stephen Ausmus, USDA-ARS

Respect Your Product for What It Is!

The **Premiere, Authentic**, Low Fat, High Fiber, High Protein **GUT HEALTHY, ANTI-OBESOGENIC** Food:
Non GMO, Gluten Free, No cholesterol

The Secret of the "Ancients" Rediscovered

Culinary flexibility: whole food, whole powder, ingredient, any flavor/cuisine, texture, crunch



Get “Tuned In” (Impossible/Beyond)

9NEWS.com



HEALTH

LESS BEEF, MORE BEANS. EXPERTS SAY WORLD NEEDS A NEW DIET

A report from panel of nutrition, agriculture and environmental experts

Recognize that there is a global movement to save lives and the planet

'Planetary health diet could help save lives and the planet - CNN

<https://www.cnn.com/2019/01/16/health/new-diet-to-save-lives...planet.../index.html>

18 hours ago - The "**planetary health diet**" is based on cutting red meat and sugar consumption in half and upping intake of fruits, vegetables and nuts. And it can prevent up to 11.6 million premature deaths without harming the **planet**, says the report published Wednesday in the medical journal The Lancet.

Here's how to get everyone to adopt the planetary health diet plan ...

<https://www.wired.co.uk/article/planetary-health-diet-plan> ▼

1 day ago - The scientists behind the **planetary health diet** admit that the changes required are radical. Here's what governments and food producers can ...

Videos



New diet can save lives and the planet, study says

CNN.com - 3 days ago



Health Minute: Can "Planetary Health diet" save us?

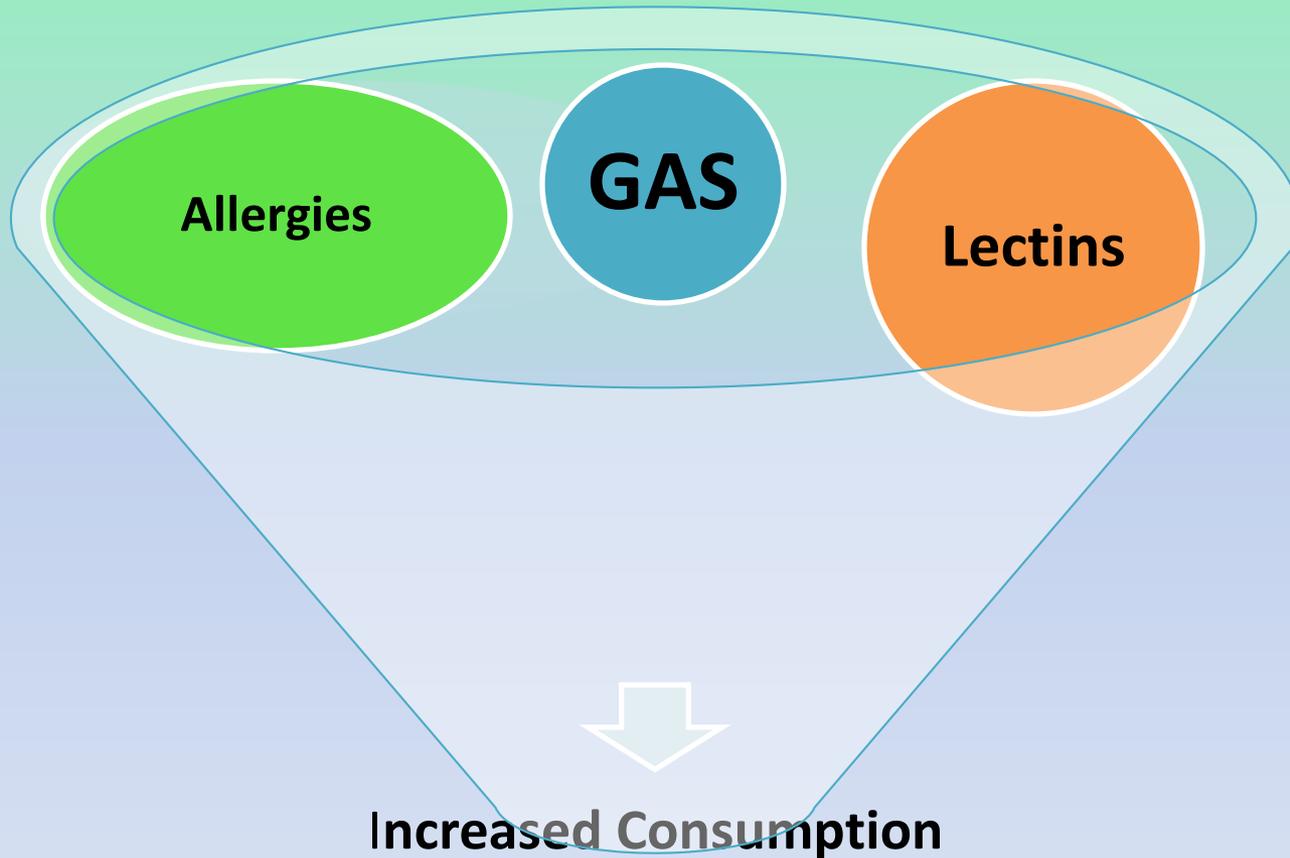
RocketCityNow.com - 15 hours ago



The Diet That Will Save You & The Planet | MTV News Unfiltered

MTV International
YouTube - 20 hours ago

Presumptions/Assumptions



**Beans & Gut Health: Creating a
Foundation for Healthy Living**

PLEASE

**For the next 15-20 minutes let's look
at the science**

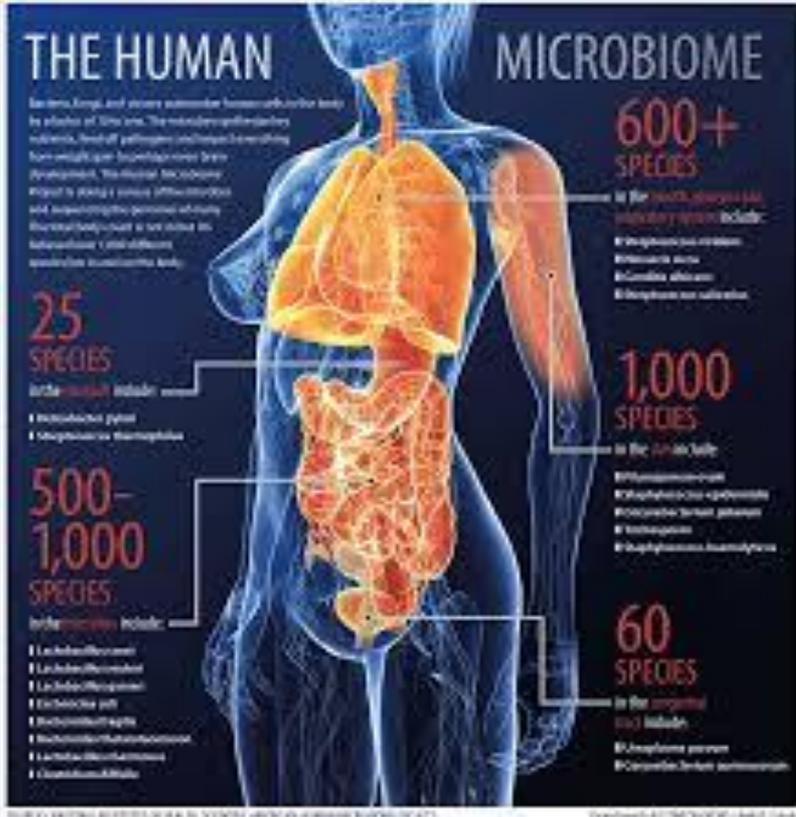
To build your tool kit.

Beans go viral!

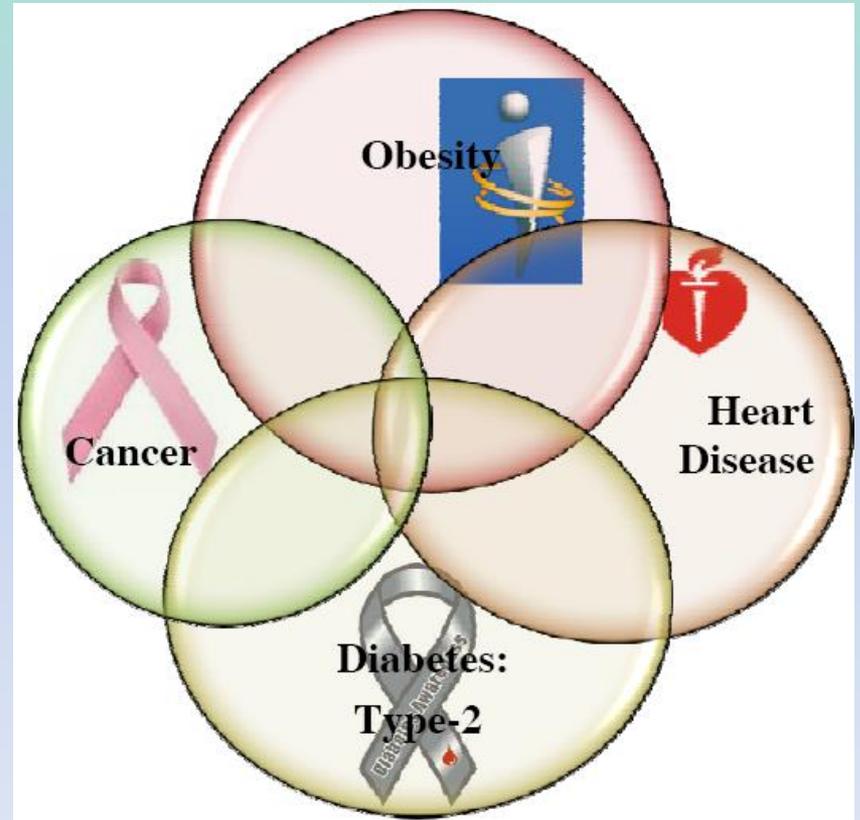
**Water is wet, fire is hot and I
eat beans and brush my teeth
every day: it's a habit**

Improved gut health

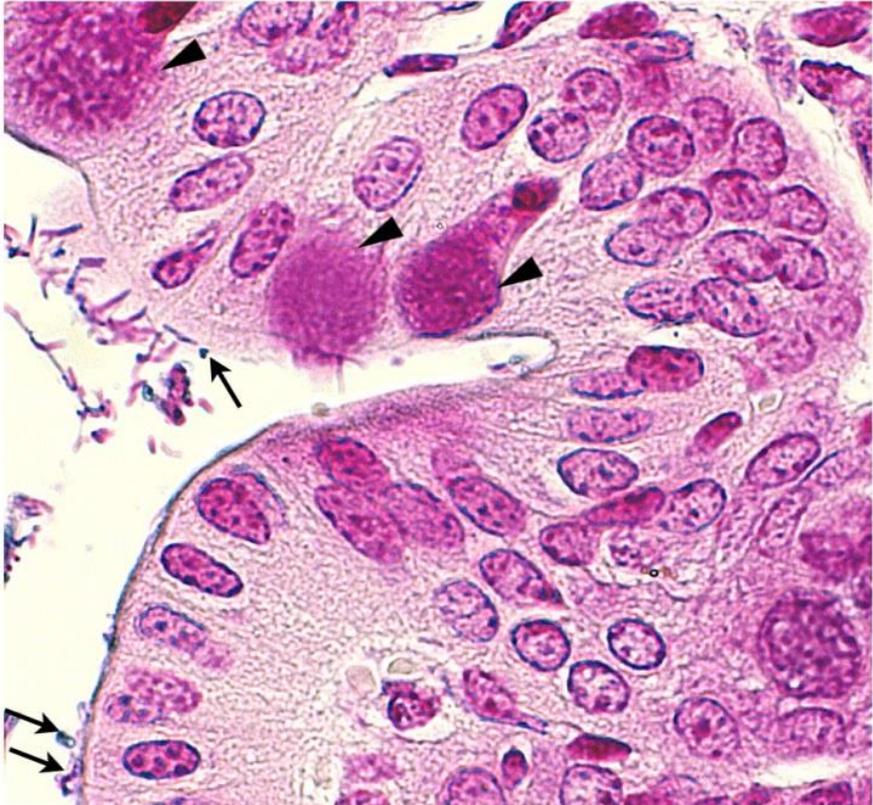
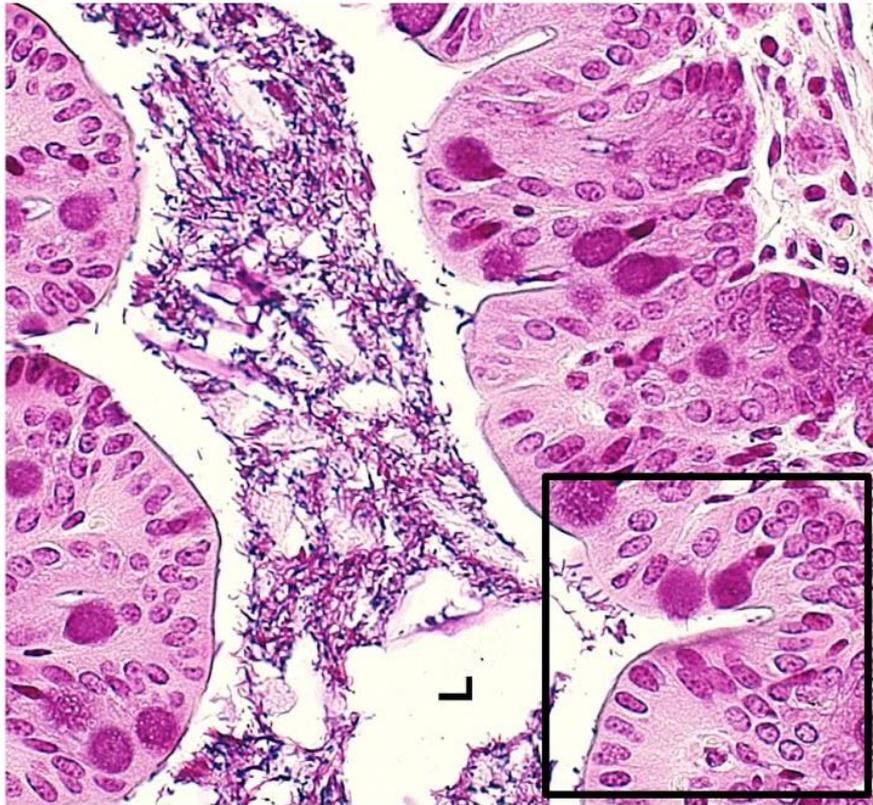
Monk et al. J. Nutr Biochem 2017



Martens, Eric. J. Mol Biol. 2014



Gut Microbiome to the immune system



Gut Health

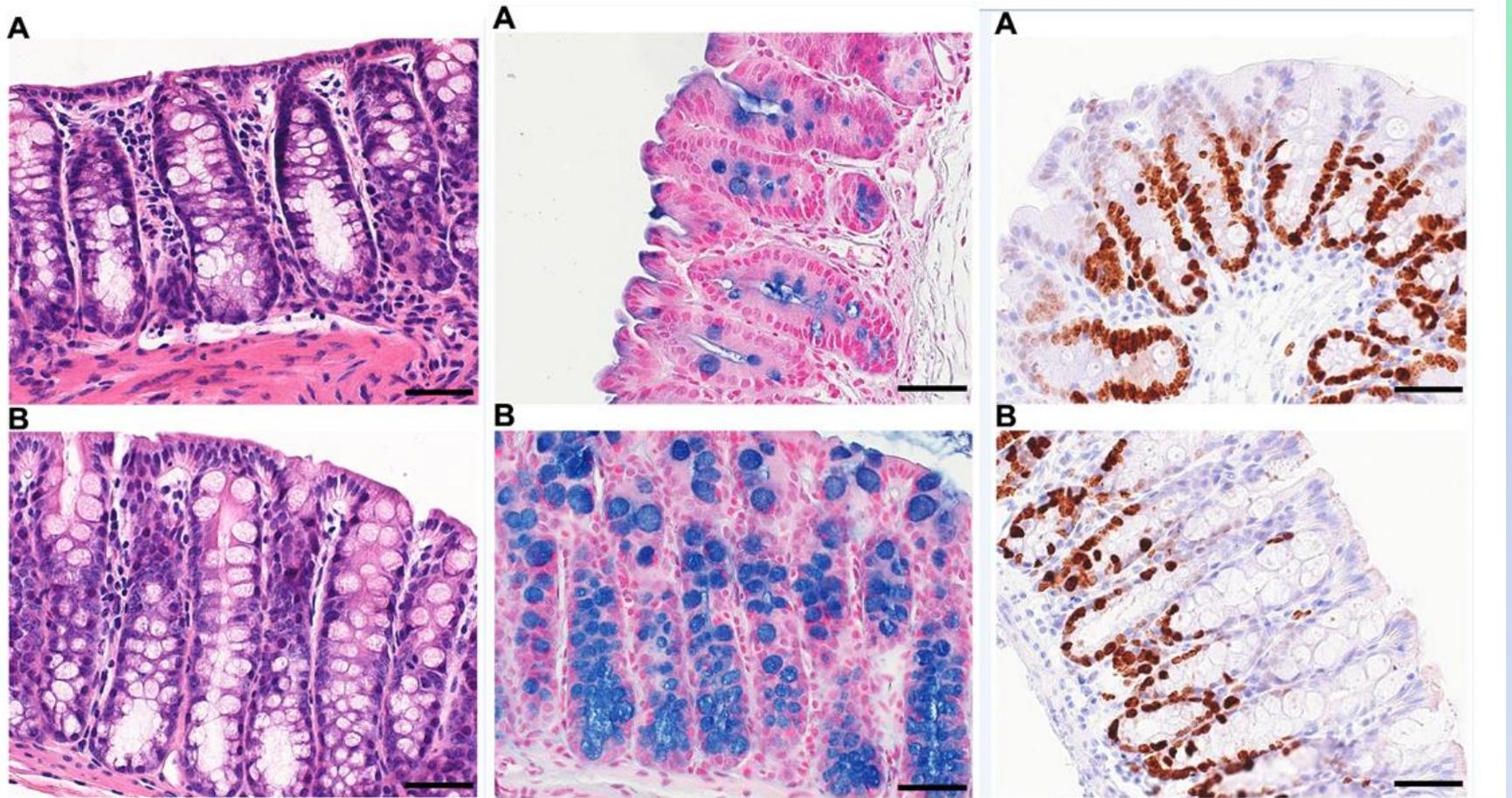


Figure 1. Panel A, control; Panel B, bean. Bar is 50 μ M.

Effect of pulses on the gut microbiome

Table 2.a		Bacterial concentration relative to HF (fold difference)	<i>Akkermansia Muciniphilia</i> relative to HF (fold difference)	Firm/Bact ΔCt_Ratio
Diet	Cecum (mg)			
HF	182	-	-	0.11
LF	255	2.4	0.26	0.12
Chickpea	333	2.8	2.12	0.15
Lentil	354	3.1	98	0.18
Common bean	356	3.2	156	0.16
Dry pea	330	3.0	0.82	0.12
Overall p-value	0.0001	0.0001	1×10^{-6}	0.001

High fat (HF); low fat (LF); N=8-10/group; p-values from ANOVA for effect of diet.

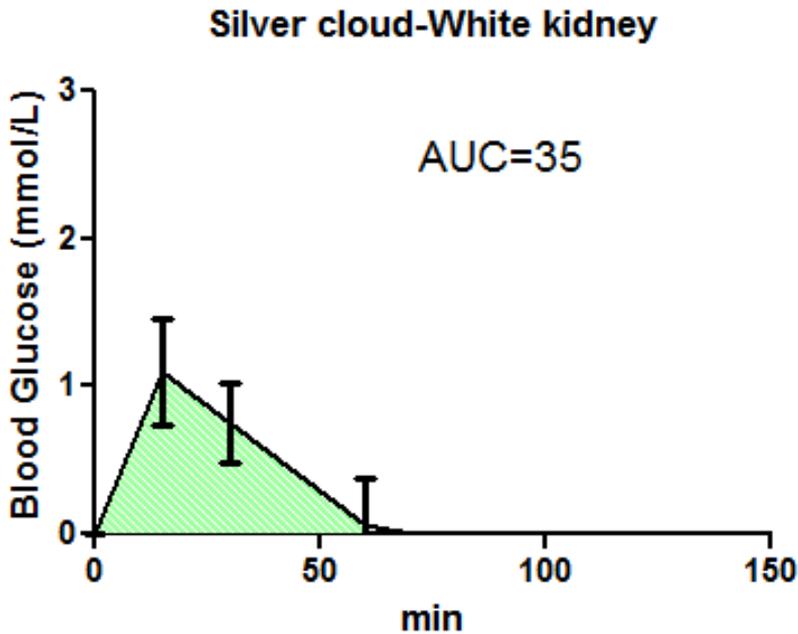


Ranges: Dietary Fiber Components

Crop	Insoluble DF	Soluble DF	Total Oligosaccharide	Total DF
Bean, Dry	11.4-16.2	3.4-10.6	2.6-4.7	20.0-27.0
Chickpea	10.6-18.8	1.9-6.3	0.3-3.8	15.8-25.8
Lentils	11.5-15.0	2.6-4.2	2.8-4.0	17.1-21.6
Peas, Dry	11.6-21.9	1.6-7.6	3.0-6.5	20.1-30.6

	Pinto Beans	Lentils	Wheat WW bread	Whole Corn	Brown Rice	Potato
Fiber (g/100kcal)	6.3	6.7	2.1	3.2	1.6	2.4

Type-2 Diabetes: Beans have a low glycemic response that varies by cultivar



Bean variety-market class	AUC
Norstar - NB	33
Silver Cloud - WK	35
U159 Great Northern Land Race	
Race	46
Small Red	49
Lassen - WK	51
Common Red Bean Land Race	52
Pinto Bean	55
Black	55
Dark Red Kidney	59
Vista - NB	59
Blackeye Bean	61
Pink Bean	64
White Kidney	68
Myasi Bean	68
Beluga - WK	73
Seahawk - NB	76

b



Nervous

Parkinson's Disease,
Alzheimer's Disease,
Multiple Sclerosis



Musculoskeletal

Frailty, Osteoporosis,
Rheumatoid Arthritis,
Gout



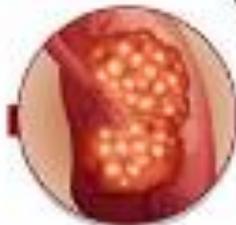
Cardiometabolic

Obesity, Diabetes



Pulmonary

Cystic Fibrosis



Cancer

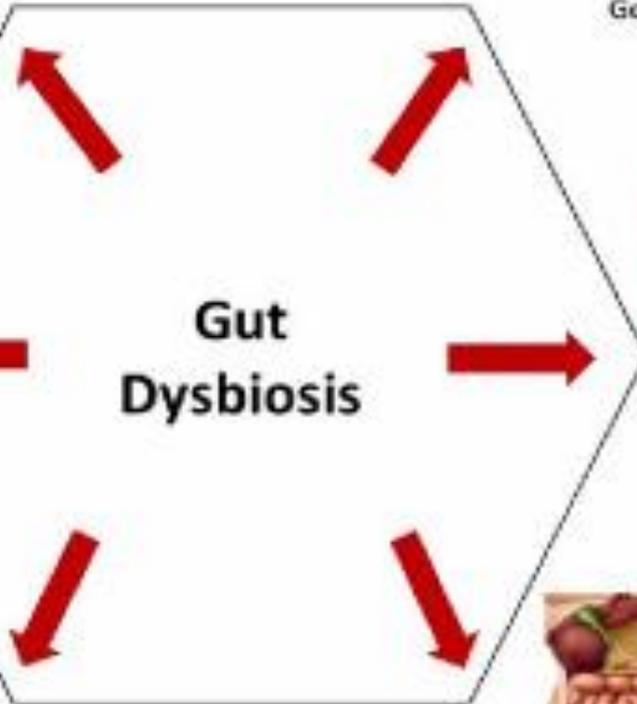
Colon



Digestive

IBS, Crohn's
Disease

**Gut
Dysbiosis**





Let's Start With a Simple Question

- If there was an inexpensive type of food that you could enjoy eating, and by consuming that food every day you would have 35% less body fat than a friend of the same weight, would you eat it?
- In formulating an opinion, please consider:
 - In the next 60 minutes more than \$100,000 will be spent by overweight and obese adults in the United States in pursuit of weight control
 - 225 individuals will die from obesity associated chronic diseases .



The Surprising Answer (USA)

- You might be inclined to wonder how the answer could be “No, I’m not interested”.
- But current food consumption trends indicate that perhaps **unwittingly, a common response is in fact, “No”**



What Is That Food?

Pulses: grain legumes

What Are Pulses?

- Dry Beans
- Dry Peas
- Chickpeas
- Lentils



- Affordable
- Accessible
- Easily stored
- Sustainable
- Low
water/fertilizer

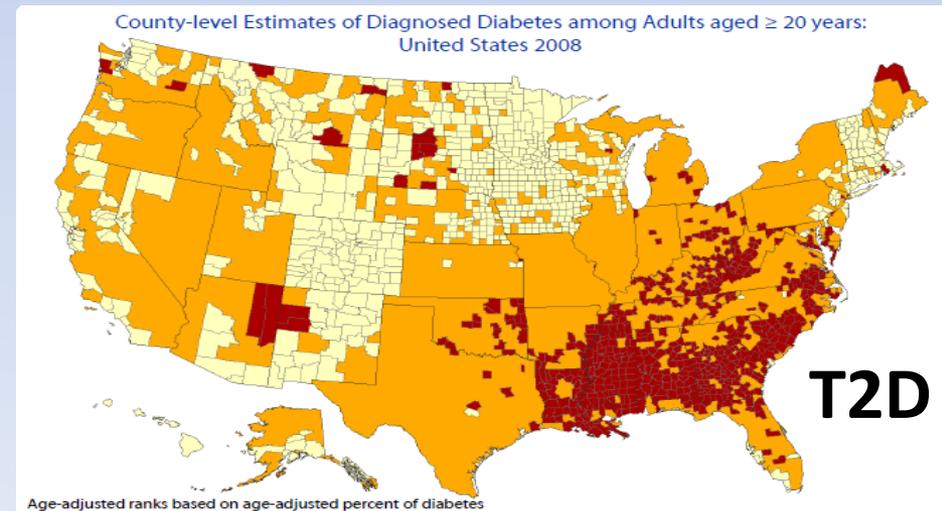
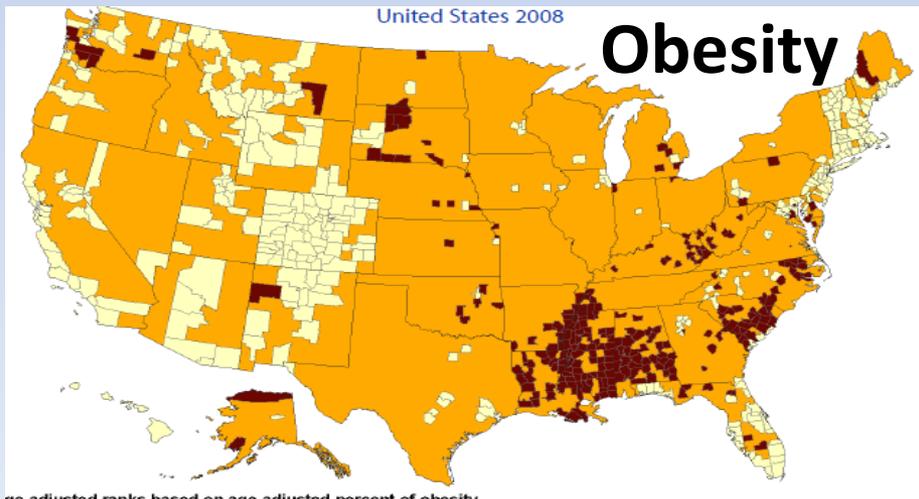
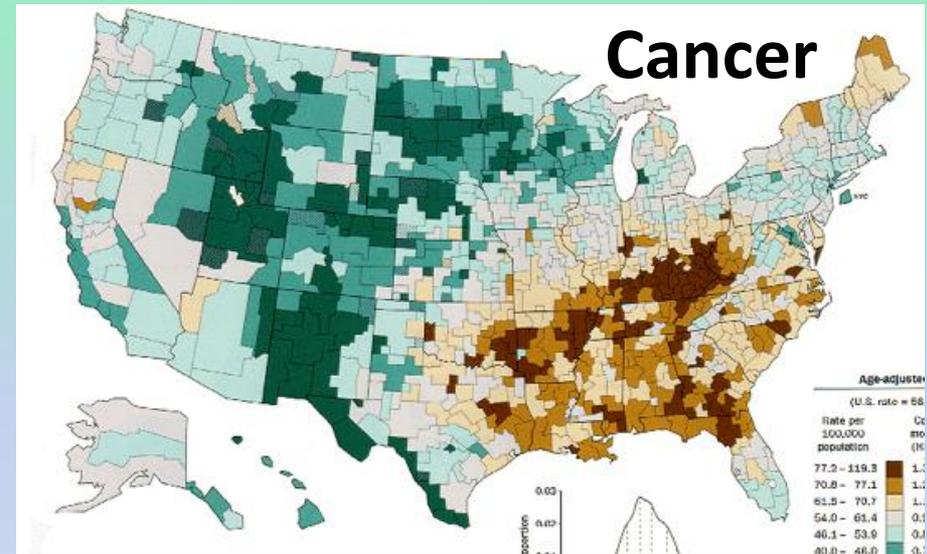
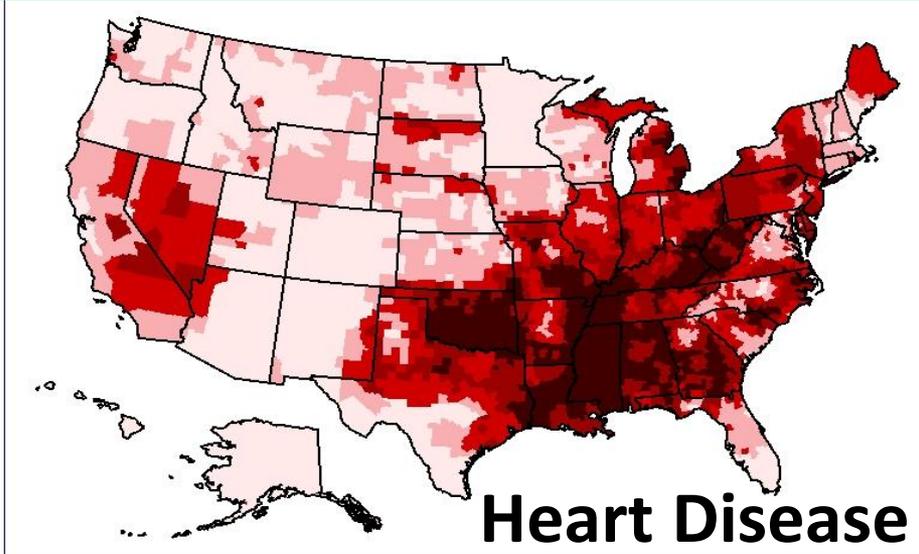
What Are the Facts (USA)?

- In the United States, where the prevalence of obesity is high, over 60% of Americans consume no bean.
- Per capita intake is less than 10g/day; whereas, it is 240 to 400 g/day in other global populations less affected by the obesity pandemic.

Why Does It Matter (USA)?

- In addition to obesity's serious health consequences (obesity-associated accounts for 60% of mortality per annum),
- Obesity has real economic costs that affect all of us.
 - The estimated annual health care costs of obesity-related illness are \$190.2 billion or
 - nearly 21% of annual medical spending in the United States .
- It has been suggested that dietary intervention programs should focus on increasing pulse consumption due to the health-promoting and disease-preventative properties of this food.

The Inter-Relatedness of Chronic Diseases

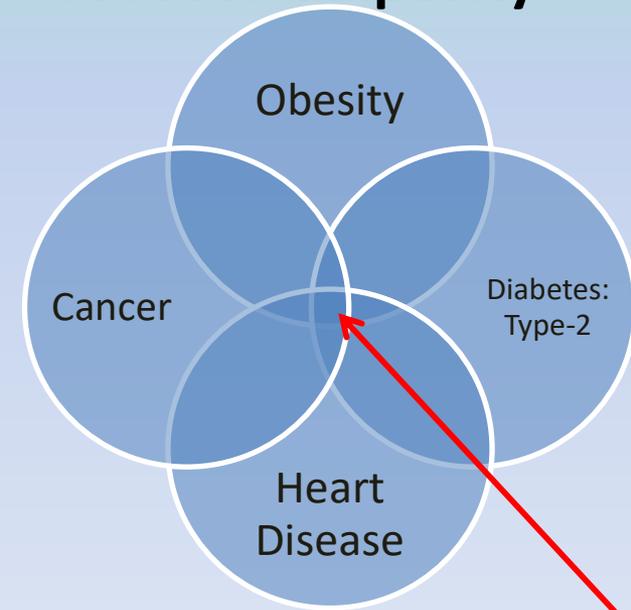


Clinical evidence

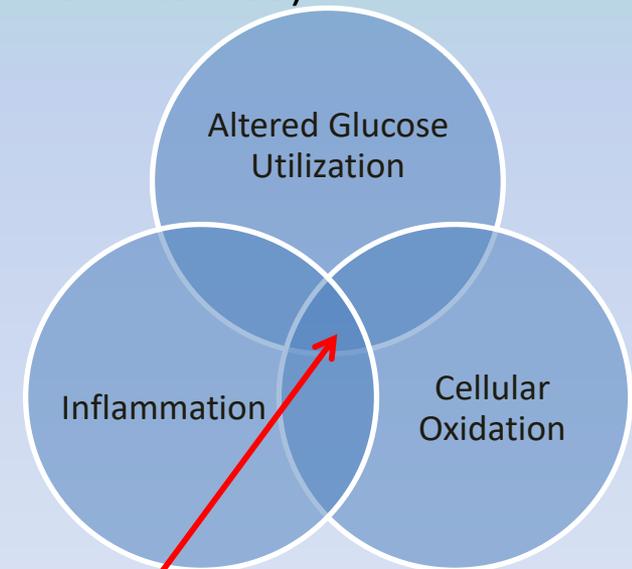
Viguiliouk, E., 2017

Systematic review and meta-analysis of 21 randomized controlled clinical trials, pulse consumption was associated with **improved weight control and reduced adiposity**

Dietary pulses at a **median dose of 132 g/day** were found to lower body weight (mean difference = -0.34 kg (95% CI: -0.63 to -0.04 kg)) and body fat (mean difference = -0.34% (95% CI: -0.71 to 0.03))



Lipid metabolism



Underlying Pathogenesis

Paired-feeding of commercially processed bean powder

The magnitude of the difference in total visceral adiposity between control and bean fed rats was 27.8% in the OS rat strain and 43.4% in the OR rat strain.

Diet ¹	Final body weight ₁ (g)	Feed efficiency ratio (g)	Retro-peritoneal fat ² (mg/m ²)	Para-metrial fat (mg/mm)	Peri-renal fat (mg/m ²)	Total visceral fat (mg/mm)
	Obesity Sensitive (OS)					
Control	230	0.321	77.1	185.6	25.9	288.6
Bean	226	0.323	67.5	136.9	13.8	218.2
	Obesity Resistant (OR)					
Control	166	0.251	38.5	88.2	14.2	140.8
Bean	164	0.260	25.1	59.9	5.7	90.7

¹ Values are means \pm SEM; ² Units are mg mass divided by length of tibia in mm; ³ For factorial ANOVA, Strain is OR vs OS, Diet is Control vs Bean; OS Control n=7, OS Bean n=7, OR Control n=6, OR Bean n=6.

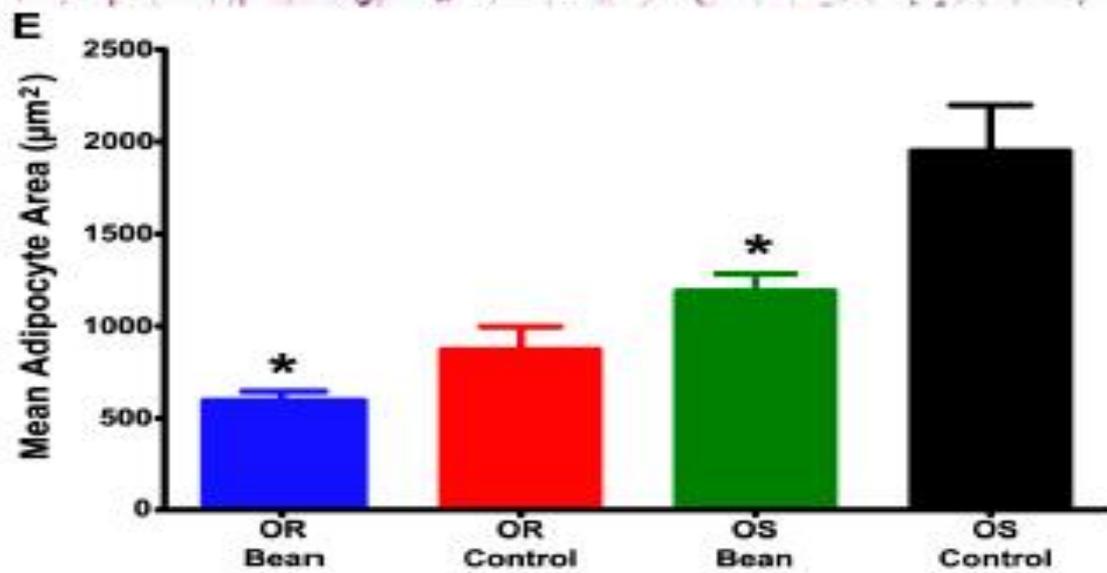
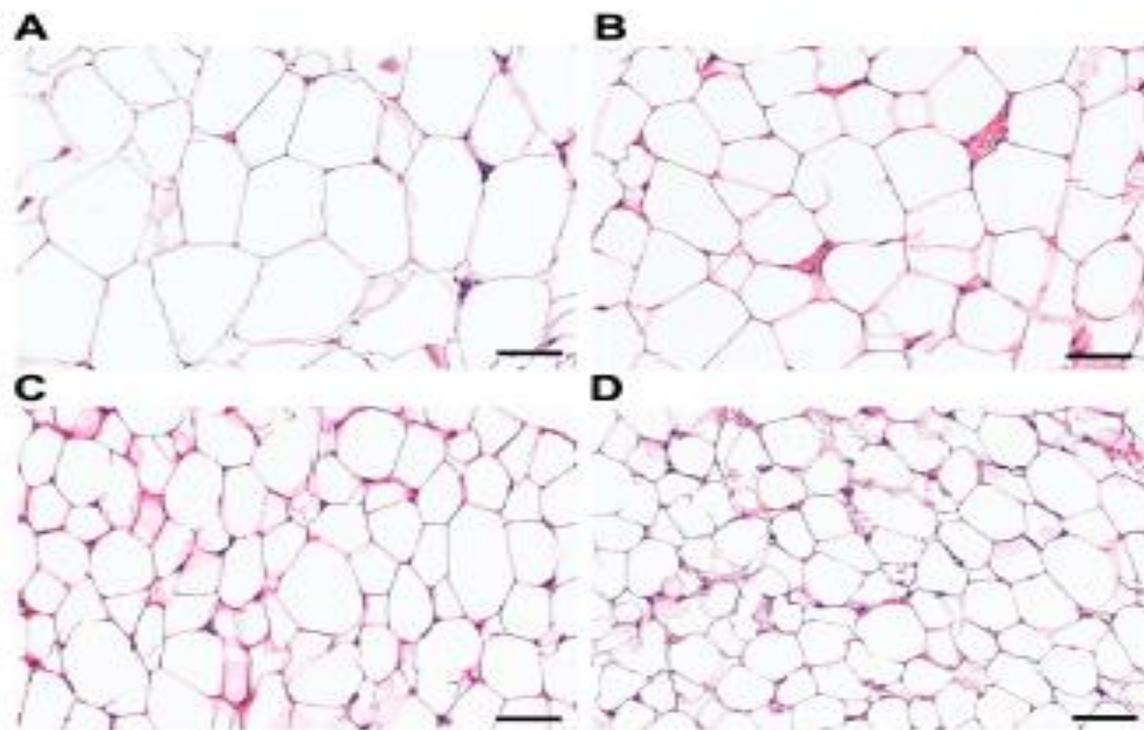


Table 1.a	Total diet eaten g	Total weight gained g	Feed efficiency ratio
Control	153.7±6.6	2.7±2.9	0.022±0.019
Bean	164.8±17.4	3.4±2.4	0.016±0.015
p-value	0.10	0.59	0.24
N=8/diet group. Values are means ± SD. Study duration: 84 days			

Table 1.b	Visceral fat mass g	Subcutaneous fat mass (g)	Total fat mass (mg)
Control	3.39±0.14	1.15±0.03	4.55±0.14
Bean	3.01±0.14	0.83±0.03	3.84±0.015
p-value	0.045	0.00003	0.004
N=8/diet group. Values are LSM ± SEM. Study duration: 84 days			

Table 1.c	Total feces excreted (mg/d)	Fecal energy concentration (kcal/g)	Total fecal energy/d (kcal)
Control	257±34	3.78±0.16	0.97±0.13
Bean	270±49	3.77±0.06	1.02±0.19
p-value	0.34	0.69	0.35

N=8/diet group. Values are LSM ± SEM. Study duration: 84 days

Figure 1.a. Panel A, control; Panel B, bean fed. Bar is 1µM.

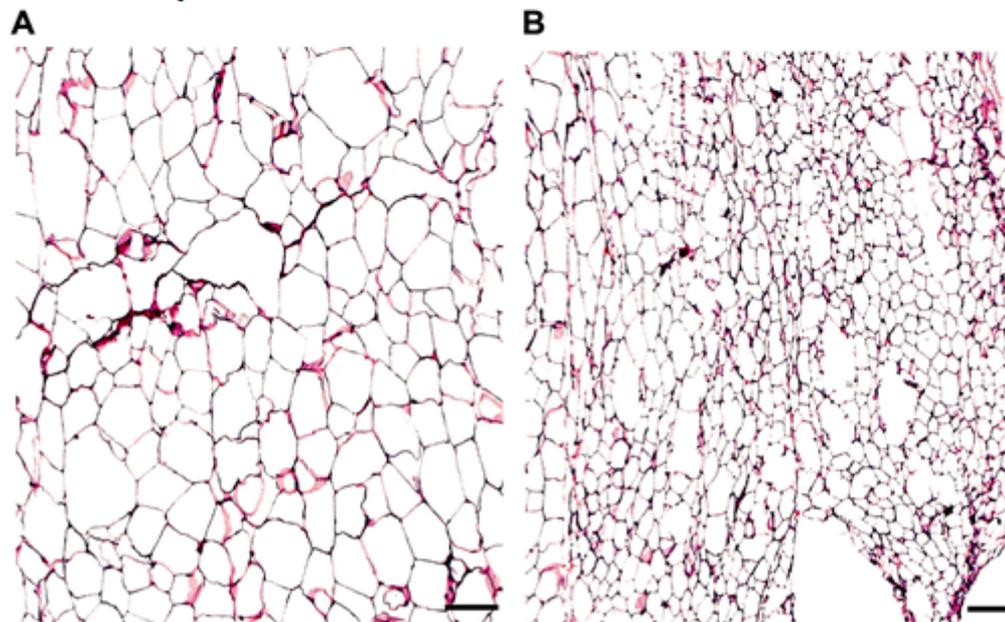
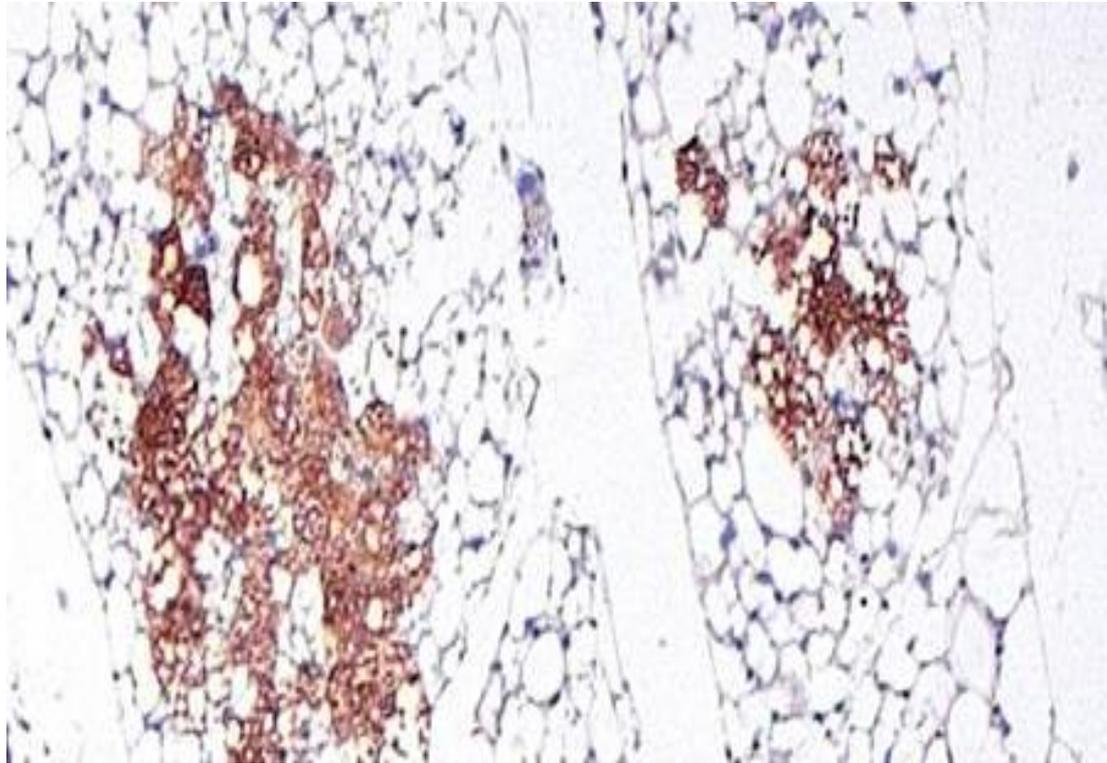
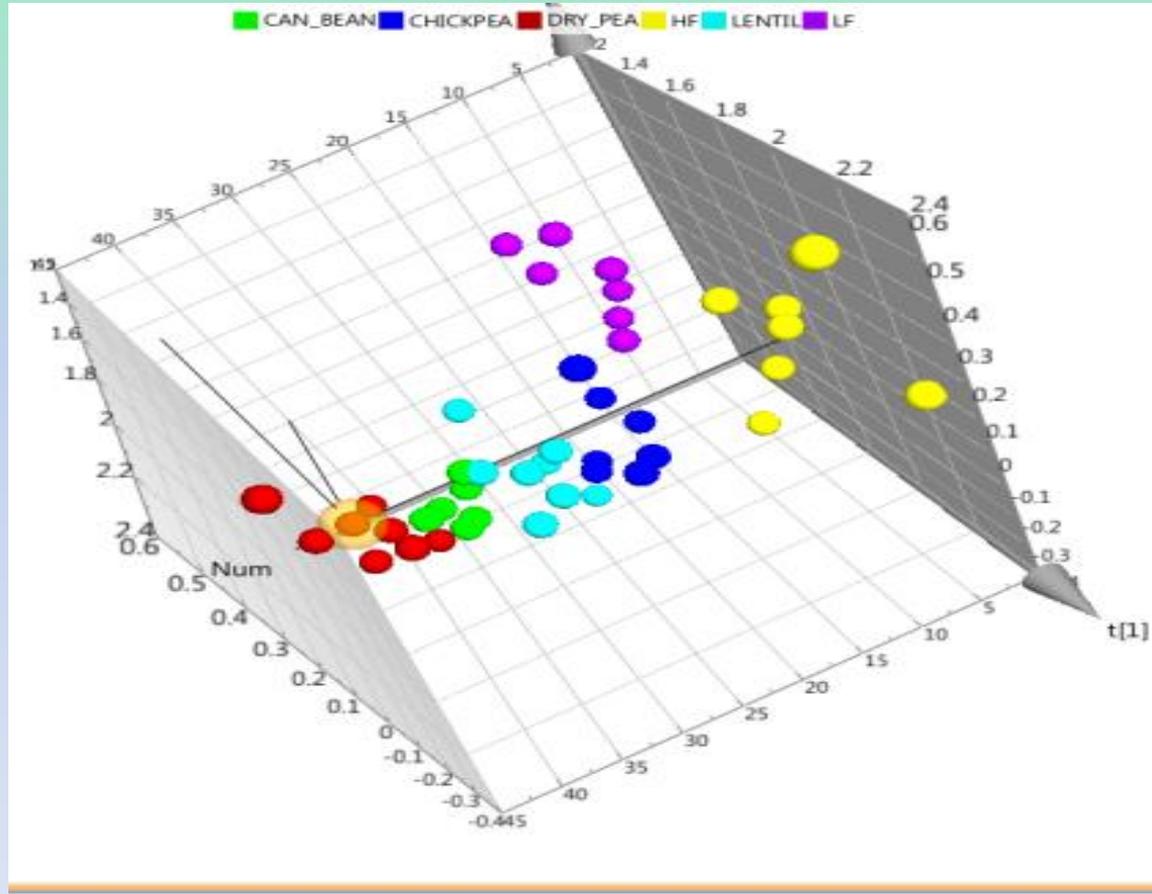


Figure 6. Bean fed mice Induction of adipocyte beiging in WAT and of UCP1 assessed via IHC



Pulses and obesity





Cardiovascular disease

- Dietary fiber intake for Americans is 12-16g/d, which is far from the requirement which is 28-42g/d; 95% Americans fail

Dietary Fiber Intake and Mortality in the NIH-AARP Diet and Health Study

Yikyung Park, ScD; Amy F. Subar, PhD; Albert Hollenbeck, PhD; Arthur Schatzkin, MD†

Conclusions: Dietary fiber may reduce the risk of death from cardiovascular, infectious, and respiratory diseases. Making fiber-rich food choices more often may provide significant health benefits.

Arch Intern Med. 2011;171(12):1061-1068.

A higher ratio of beans to white rice is associated with lower cardiometabolic risk factors in Costa Rican adults¹⁻³

Josiemer Mattei, Frank B Hu, and Hannia Campos



Willett's gp (Intl.J Cancer 2005) Beans/Lentils Reduce Breast Cancer R

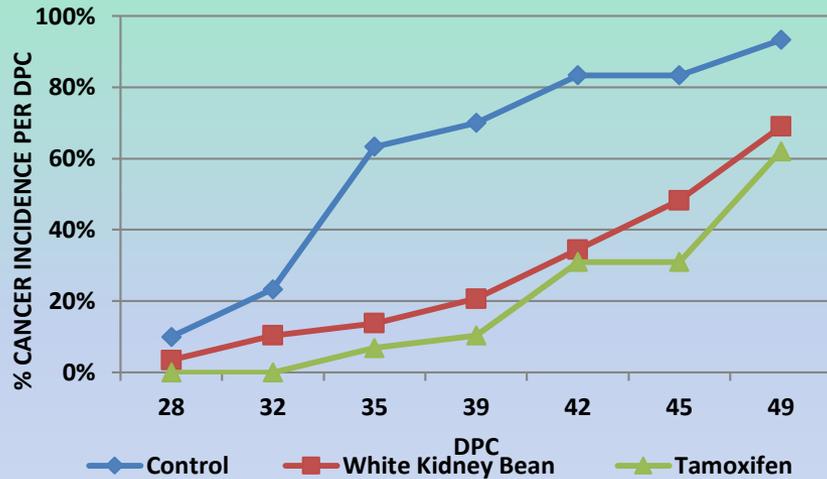


Dietary beans	<i>n</i>	Incidence ¹	Multiplicity ²	Tumor burden ³	Latency ⁴
%		%	AC/rat	g/rat	<i>d</i>
0	30	70 ^a (51, 85)	3.13 ± 0.39 ^a	1.85 ± 0.74 ^a	35
7.5	30	57 ^b (37, 75)	2.17 ± 0.32 ^b	1.43 ± 0.46 ^a	39
15	30	75 ^a (56, 90)	2.60 ± 0.35 ^{a,b}	1.38 ± 0.41 ^a	39
30	30	57 ^b (37, 75)	1.73 ± 0.29 ^{b,c}	0.86 ± 0.31 ^b	42
60	29	41 ^b (24, 61)	1.48 ± 0.27 ^c	0.67 ± 0.19 ^b	>42
<i>P</i> -linear trend		0.045	0.001	0.01	0.01

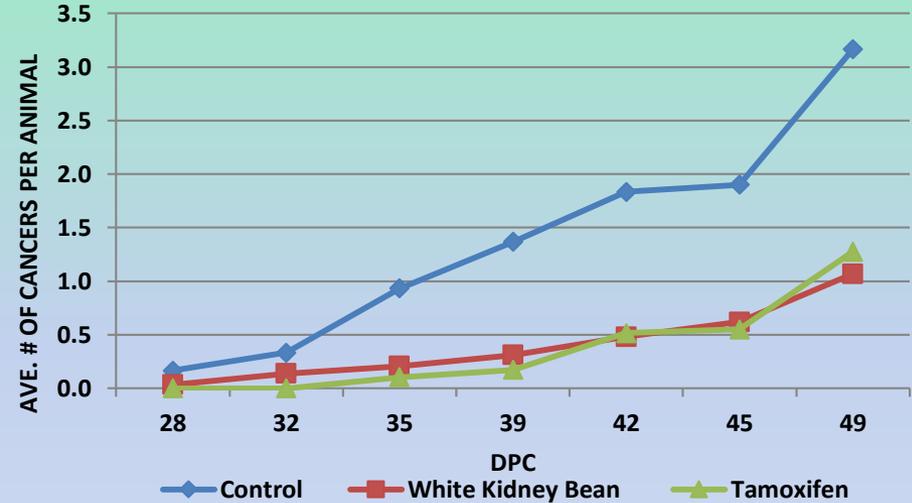


A Food can have an Effect = to a Drug (Bean vs. Tamoxifen)

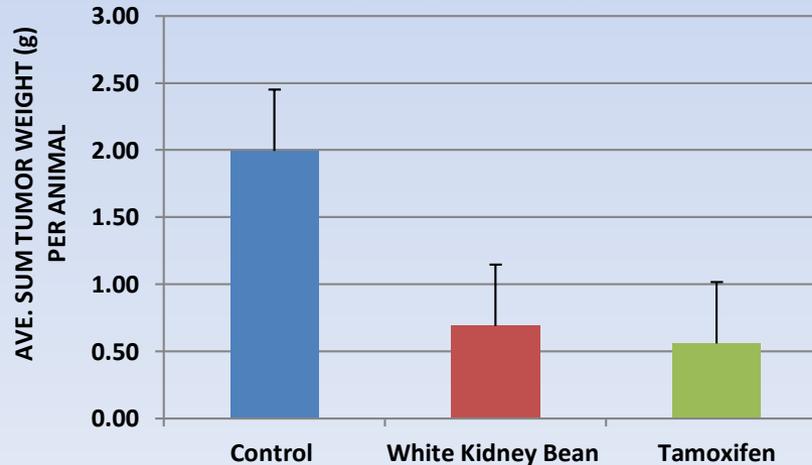
CANCER INCIDENCE



CANCER MULTIPLICITY



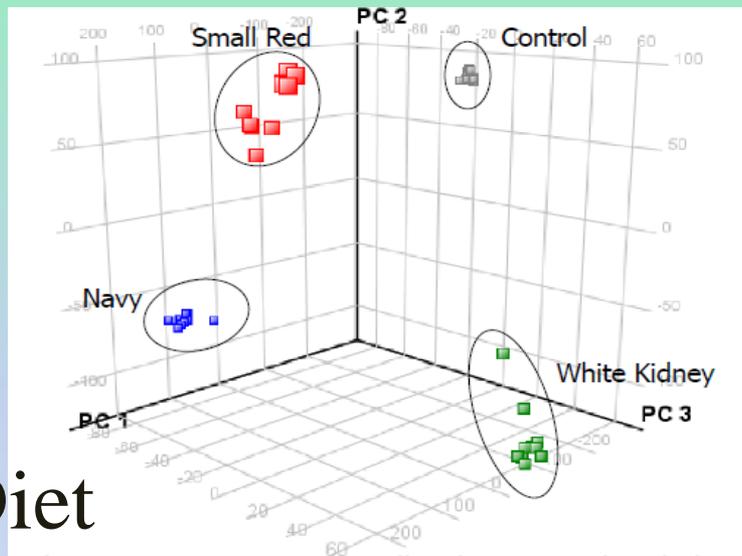
TUMOR MASS



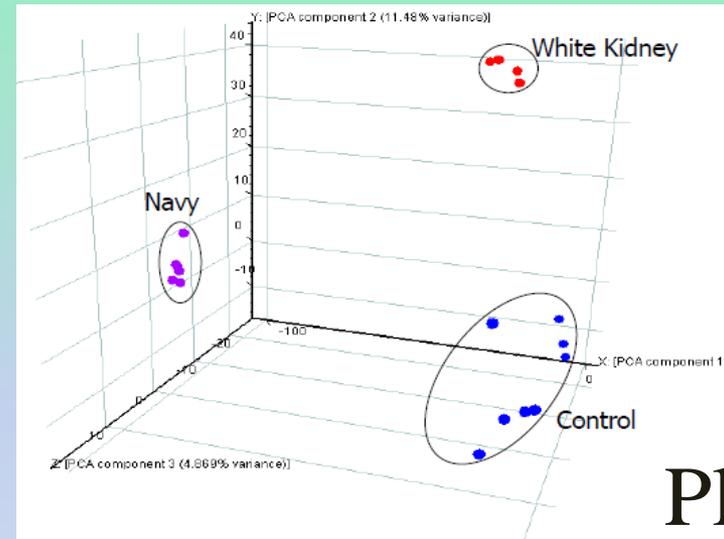


Beans alter Metabolite Profiles

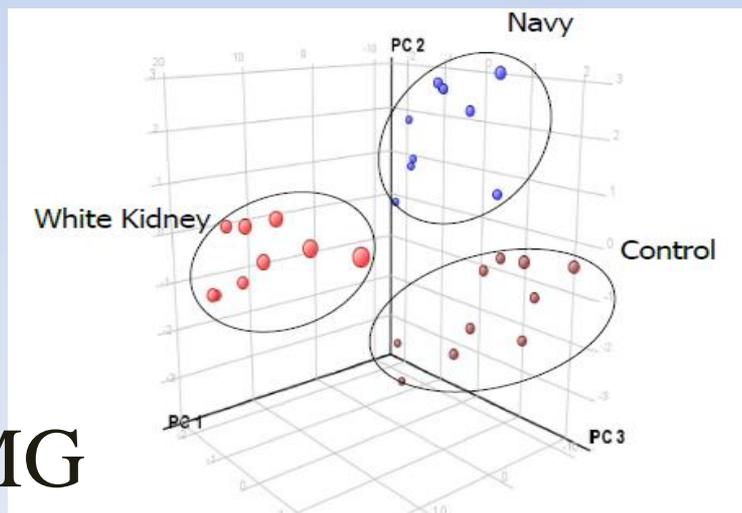
Lipid Metabolism Implicated



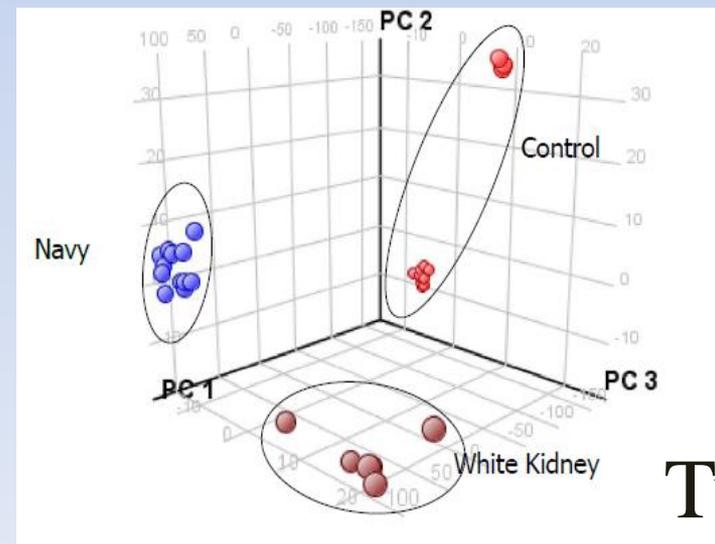
Diet



Plasma



MG



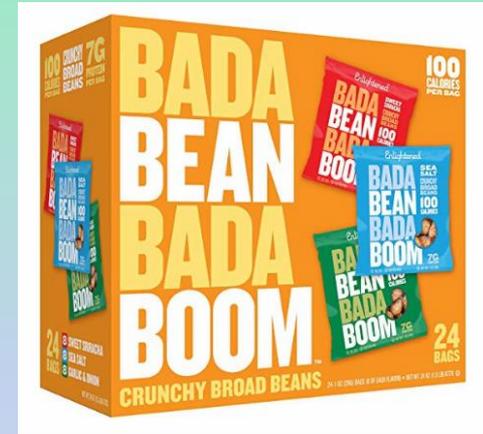
Tumor

The Challenges for Beans

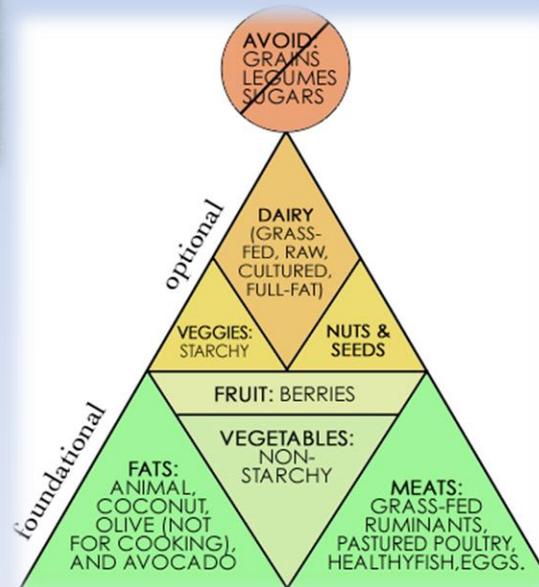
Awakening & Awareness



Creation of Contemporary Products



Busting Myths



**Motivate the consumer: the physique of antiquity:
Eat pulses to lose weight/stay thin: but not snake oil**



**Consumer demand: new product
development**



**Consumer demand puts
pressure on supply**



**Here we need to be smart: What does success look
like to the PRODUCER?**



**Demand drives acreage planted: Drives
need for R&D funding**

Control Your Inventory: what may be possible

- Increased consumption of high fiber elite pulse cultivars
- Motivate consumption of a can of beans(pulses) per day: improved gut health **enhances athletic performance** and the maintenance of a physically active lifestyle.
- Consumption of **420g** cooked dry bean per day versus the current estimated intake of **10g** per person per day.
- Colorado has an estimated population of 5.6 M. If this work shows that bean consumption (420g/d) enhances athletic performance and the maintenance of a physically active lifestyle, we estimate (conservatively) that **15%** of the population (approximately **1M people** in Colorado) would follow the recommendation (**1 can of processed bean/d; this is 420g/d**).
- That would require **360,000 cwt per annum** of dry bean production to meet demand in Colorado. This is equivalent to **\$10M** of increased consumption at \$28 per cwt.



What's Next: "In-Pulsed": Origins Cuisine...or?? A Metabo-Centric Weight Control Cuisine

BUT: Which pulses qualify???



Are You Ready to Join Global IN-PULSE Team?

Better Food, Every Person, Every Day, The World Round

Healthy food, Healthy living: natural, affordable, delicious, nutritious



Questions?

Pulses

The **Premiere, Authentic, Low Fat, High Fiber, High Protein ANTI-OBESOGENIC** Foods: Non GMO, Gluten Free, No cholesterol

The Secret of the "Ancients" Rediscovered

Culinary flexibility: whole food, whole powder, ingredient, any flavor/cuisine, texture, crunch



Origins: The Earth Friendly Cuisine
Destinations: Taste the World