



• F U L L • O F •

THE CHOLESTEROL LOWERING EFFECTS OF LEGUMES

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Cholesterol and Cardiovascular Disease

Elevated cholesterol levels in the blood are responsible for some aspects of cardiovascular disease such as plaque buildup or clogging of the arteries.



Cardiovascular Disease Kills

Diseases of the blood system such as clogging of the arteries, stroke, heart attack, and associated conditions are the most frequent cause of death in the US and Canada.

Diet and Lifestyle

Diet and lifestyle factors cause much of the chronic disease burden seen in industrialized populations. Many cases of heart disease, type 2 diabetes, and cancer preventable.

Diet and lifestyle - both cause & cure

Some people want foods with health benefits

Top 10 Package Claims	Percentage of Shoppers Looking for Package Claim	Beans Meet Claim?
Whole Grain	59%	No
Low Fat	56%	Yes
High Fiber	51%	Yes
Low Sodium	48%	No
Low Calorie	45%	No
Low Sugar	44%	Yes
No Trans Fat	42%	Yes
Low /Lowers Cholesterol	37%	Yes
Vitamin/Mineral Enriched	35%	No
Calcium-Fortified	33%	No

Significance of pulses

- Legumes are rich in fiber and low in fat and sugar. Many other nutrients that can benefit the vascular system such as folate.
- Thus they have many characteristics desired by consumers.

Cholesterol Reduction

- Since 1980s, clinical studies have shown improvements in cholesterol mostly using baked beans, navy or white beans.
- Why need for more studies?
 - Variable sample sizes
 - Protocol differences – e.g. 1 cup vs. ½ cup
 - Men only
 - Controlled versus free-living

Cholesterol reduction

- In addition to studies presented today, legumes consumed in ½ cup amount daily over 4-8 weeks have been shown to lower cholesterol:
 - Chickpeas 4%
 - Vegetarian baked beans 8%
 - Mixed legumes positive effects

Cholesterol Reduction

- Many other varieties & species **not** investigated
 - Will they be same? Maybe – but need to investigate – black beans, red kidneys for *P. vulgaris* sp.
 - Other species? Black-eyed peas; favas; lentils, peas
- Message needs to 'fit' with the culturally appropriate legume

Global importance

- Pulses are staple food products around the world.
- After immigration, consumption often declines as part of dietary acculturation
- But preservation in diets may negate CVD, diabetes, obesity development

For example:

Pinto beans are important in many Latin American cultures

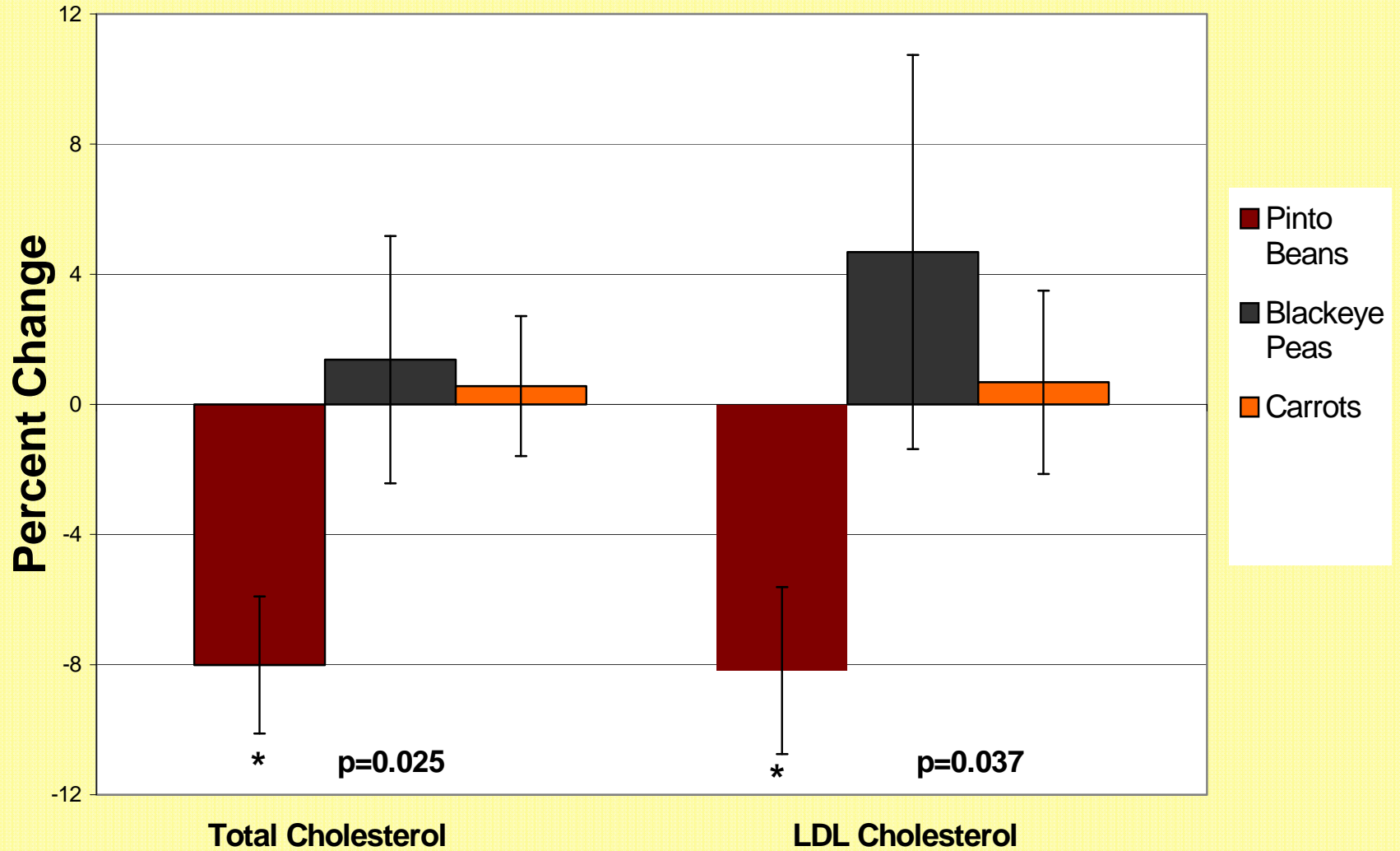
They could be a culturally familiar food used for cholesterol reduction



Pinto beans and cholesterol

- Beans for Health Alliance funded study to look at health benefits of pinto beans and black eyed peas.
- Participants were instructed to eat a $\frac{1}{2}$ cup serving of the food as part of their usual dietary intake
 - 3x3 crossover trial for 8 weeks
 - Recommended amount
 - Free-living individuals

Percent change: Total and LDL cholesterol



Pinto Beans lower cholesterol

- Produced physiologically significant changes in serum TC and LDL-C of -8% and -8.2%
 - Equate to reductions in risk for CHD of 8% and 16%, respectively
- Daily pinto bean intake of ½ cup is a realistic diet modification that can be recommended for improving TC and LDL-C in generally healthy people or those with increased risk for CHD

- Now we have several varieties of pulses with documented cholesterol reducing effects
- But consumers know oatmeal, and they don't know beans...

Consumers know oatmeal

- **Oatmeal and oat bran** – strong evidence of cholesterol reduction, but lower magnitude of effect than with most pulses
- Advertise 4% reduction
- 1-1/2 cups oatmeal versus 1/2 cup of pinto beans



But consumers don't know beans ...

- Putting the information in perspective ...
- Total cholesterol is 200 minus 4% = 192
- 200 minus 8% = 184.

In conclusion



- Many pulses appear to be effective at lowering cholesterol
- Consumer awareness is low for pulses and CVD
- Important to assess health benefits of pulses common globally

Thank you!

Important Protective Components of Pulses

- Dietary fiber - Soluble fiber; Resistant starch
- Vitamins (folate, thiamin, riboflavin, niacin)
- Minerals (Fe, Zn, Ca, Mg, Se, Cu, P, K)
- Other: Phospholipids, Antioxidants
- 'Whole' products: more health benefits than the sum of individual components – synergistic effects
- Satiating and filling, thus displacement of less healthy foods