



• 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

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

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# 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



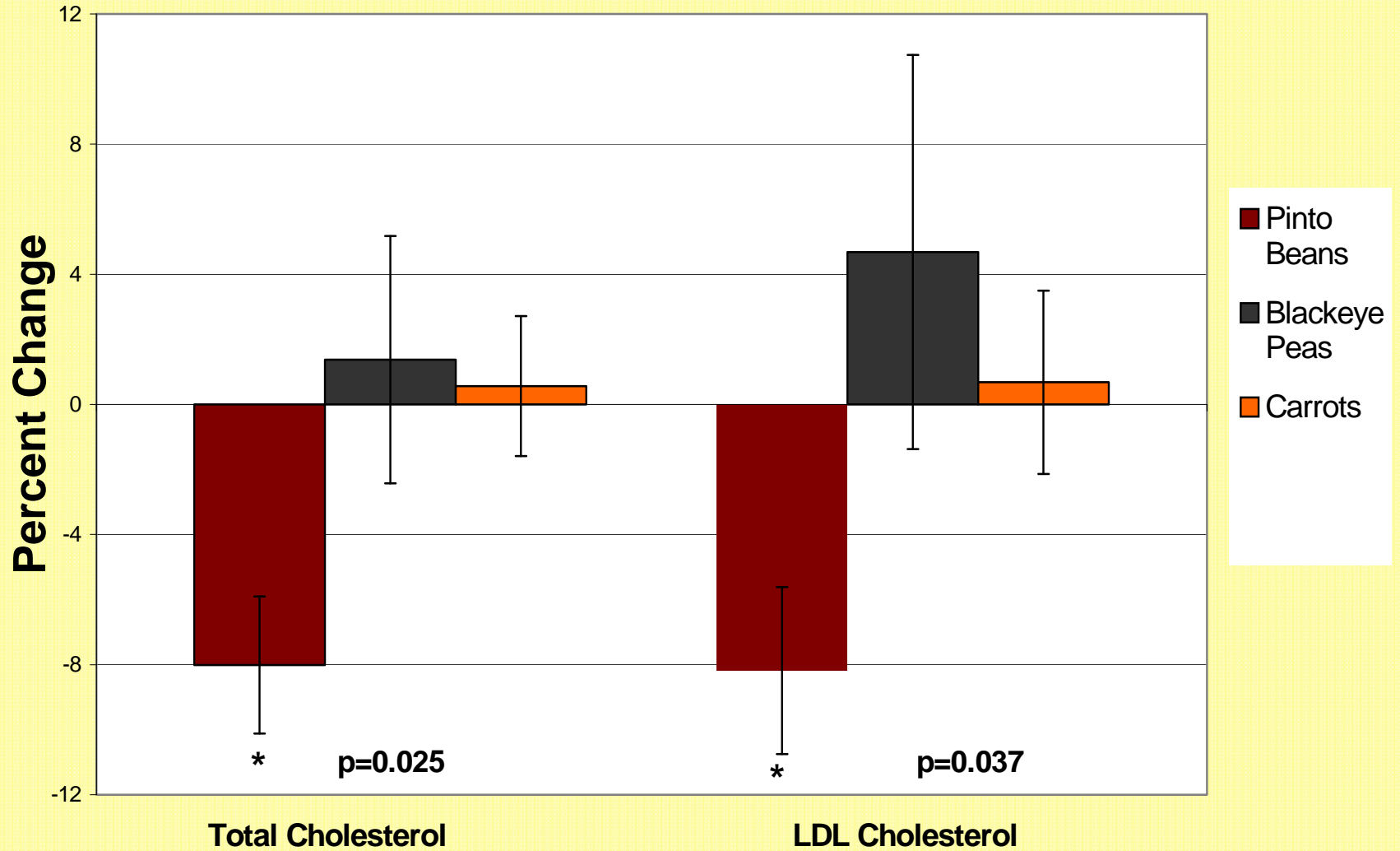


# Pinto beans and cholesterol

- Beans for Health Alliance funded study to look at health benefits of pinto beans and black eyed peas.
- Participants were instructed to eat a ½ 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