Fiber research update

Joanne Slavin, Ph.D, R.D.
Department of Food Science and Nutrition
University of Minnesota

Dietary fiber evolution

Beginning of modern cereal industry based on colon optimizing effects of whole grain
Physiological effects of dietary fiber explored – health claims for oat bran and psyllium

1920
2002

Superior laxation of whole wheat
Fiber hypothesis of Burkitt and Trowell

Fiber definitions issued – fiber given Adequate Intake (AI) in DRIs
Defining normal laxation

- Less than 3 stools per week or more than 3 stools per day
- Stool weight greater than 200 g/day is clinically defined as diarrhea, but many vegetarians have stool weights of 300 g/day or more
- Gastroenterology 1999;116:1464

Non-dietary factors that affect laxation

- Stress
- Smoking
- Coffee drinking
- Drugs (laxatives) (Lembo A, Camilleri M. New Eng J Med 2003;349:1360)
- Personality (Tucker et al. Gastroenterology 1981;81:879)

Not all fiber is created equal

- Wheat 5.4 g/g fiber fed
- Oats 3.4 g/g fiber fed
- Pectin 1.2 g/g fiber fed
- Cummings JH. 1993. CRC Handbook of Dietary fiber in Human Nutrition
Limitations to fecal samples

- Not practical in epidemiological studies
- No accepted standard
  - Stool weight
  - Stool chemistry
  - Microflora – methods, what is best
  - Stool frequency (easy to collect)
  - Quality of life (used in IBS trials)

Research progress: Dietary fiber and C-reactive protein

- NHANES 1999-2000 – dietary fiber intake was inversely associated with serum CRP – odds ratio for increased CRP was 0.48 for highest quintile of fiber intake compared with lowest (Ajani et al. J Nutr 2004;134:1181)
- Dietary fiber intake is protective against high CRP in longitudinal study of 529 subjects (Ma et al. Am J Clin Nutr 2006;83:760)

Summary

- 12 research recommendations are major knowledge gaps and highest priority
- Little progress has been made on these recommendations
- Accomplishing these studies will take dedicated research funding since the research needs would not be funded in the competitive research arena