



# **Dietary Fiber Database Development for National Health and Nutrition Survey in Korea**

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# OBJECTIVES

- As people get more health-conscious, the necessity of developing Korean food databases for nutrient contents has become more evident.
- To provide correct information on diet and nutrient intake of consumers, a 5-year project for nutrient database development was started in 2001.

# OBJECTIVES

- During last 3 decades, the incidence/prevalence of chronic degenerative diseases including coronary heart disease and diabetes mellitus showed a steady increase and cancer became the No. 1 cause of death in Korea.
- To provide useful information about diet for consumers' health and to promote the objectives of the Health Plan 2010, a dietary fiber (DF) database was developed.

# Materials and Methods

## - Food list -

- **150 Foods were selected for total dietary fiber analysis based on...**
  - **2001 National Health and Nutrition Survey data**
    - ✓ Foods consumed in large amounts
    - ✓ Foods consumed most frequently
    - ✓ Foods consumed in large amounts by specific age groups
    - ✓ Major source of crude fiber in the Food Composition Table
  - **USDA National Nutrient Database (SR-18)**
    - ✓ High dietary fiber foods were considered
  - **Excluding...**
    - Foods known to lack dietary fiber based on the earlier reports
- **Among the above, 50 Foods were selected for separate analysis of soluble/insoluble dietary fiber**

# 2001 National Health and Nutrition Survey

102 Foods consumed in large amounts  
(covered 95% of total food consumption by weight)

Another 15 foods by consumption frequency

Major source of  
crude fiber

27 foods

3 foods

Considering  
Age difference

3 foods

USDA: food with high  
dietary fiber

150 foods were selected for analysis

# Materials and Methods

- Food samples for analysis were purchased for 3 different major brands and/or places of production.
- High fat foods (>10%) were defatted before analysis using ether (25ml ether/g sample).
- Food samples were analyzed for dietary fiber by AOAC991.43 using MES-TRIS buffer.



Enzymatic digestion  
( $\alpha$ -amylase, protease,  
amyloglucosidase)



Filtration



Protein analysis



Ash analysis

# RESULTS

- A Dietary fiber database for selected Korean foods was developed, published in printed form and disseminated to universities and researchers.
- Data file was submitted to RRDI for incorporation to the **7th revision of Food Composition Table, 2006**.
- With this database, dietary fiber intake of Korean population was estimated and intake profile was analyzed.

# Food List

Food Group	Foods for analysis
Grains/ Cereals/ products (33 items)	rice, glutinous rice, brown rice, barley, mixed grains, sorghum, millet, corn, ramyon, noodles, buckwheat noodle, rice cake(plain), rice cake w/small red beans (Si-Ru Tteok), rice cake w/soybean powder (In Jeol Mi), flour, loaf bread, loaf bread (corn), bread w/small read bean paste, bread (streusel buns), soft roll, pound cake, cake, sponge cake, loaf bread powder, chips, chips(corn), chips(potato), choco-pie, ready to eat cereal(corn frosted, almond flake), Biscuit, cracker, ring doughnut
Potatoes/ Starches (4)	potato, sweet potato, starch vermicelli, acorn starch jelly

# Food List

Food Group	Foods for analysis
Sweets (1 item)	chocolate
Pulses (7 items)	kidney beans, peas, mung beans, small red beans, soybeans, tofu, soymilk
Nuts & Seeds (4 items)	Perilla seed, sesame seed, peanut, chestnut
Mushrooms (4 items)	4 kinds of mushrooms
Seaweeds (4 items)	Dried Laver, dried sea tangle, dried sea mustard, sea lettuce
Meat/fish/dairy products (5)	sausage, ham, spam, fish paste, yogurt

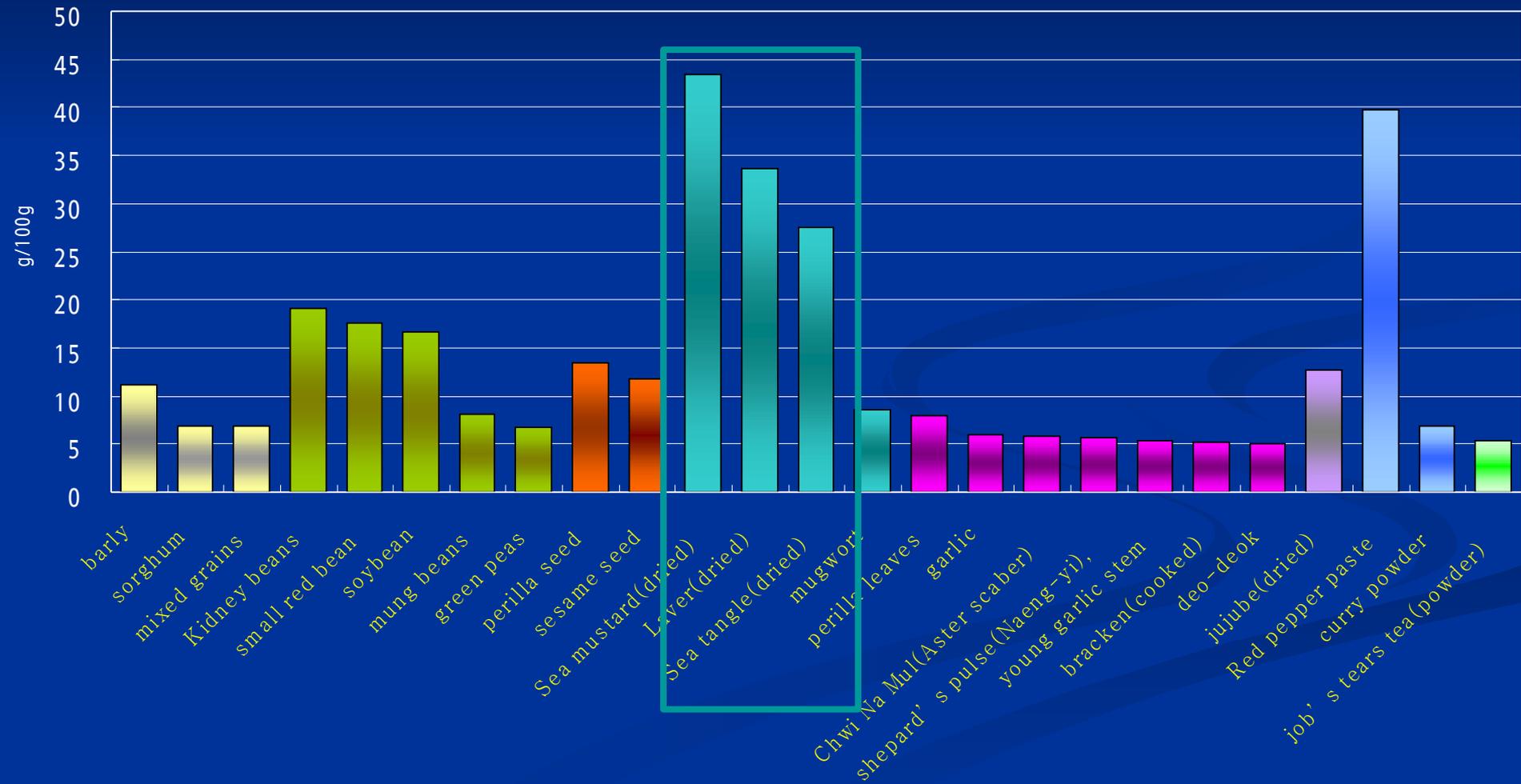
# Food List

Food Group	Foods for analysis
Vegetables (51)	eggplant, sweet potato stalks, bracken, green pepper, red pepper leaves, chard, kimchi (mustard leaves), Kkak Du Ki (Seasoned cubed radish roots), Kimchi (Na-bak), kimchi (Dong chi mi), kimchi, kimchi (w/o red pepper), kimchi (leafy radish), kimchi (cucumber), kimchi (small radish), kimchi (welsh onion), perilla leaves, Shepard's pulse (Naeng-yi), carrot, deo-deok, roots of bellflowers, garlic, garlic, young stem of garlic, radish leaves, radish root, water dropwort, Korean(Chinese) cabbage, Chinese chive, broccoli, lettuce, ginger, celery, mung bean sprout, spinach, mugwort, crown daisy, cabbage, mallow, onion, lotus root, cucumber, burdock, Chwi Na Mul (Wild plant, <i>Aster scaber</i> ), soybean sprout, taro stalks, tomato, tomato juice, welsh onion, sweet green pepper, pumpkin, zucchini

# Food List

Food group	Foods for analysis
<b>Fruits</b> (17 items)	Persimmon, tangerine, jujube(dried), strawberry, melon, banana, pear, peach, apple, watermelon, orange, orange juice, plum, Chinese melon, grapes, raisin, grape juice
<b>Beverage</b> (10 items)	Carrot juice, functional food: dietary fiber drink, Sik-Hye (sweet rice drink), Tak-Ju (Korean rice liquor), green tea (canned), citron tea, job's tears tea, instant coffee mix, coffee (canned), tea (canned)
<b>Seasoning</b> (7 items)	Red pepper powder, red pepper paste, soybean paste, mixed soybean paste w/red pepper paste, black sauce paste (Ja Jang sauce), curry powder, tomato ketchup
<b>Others (3)</b>	Wontons, pizza, hamburger

# Foods with high content of total dietary fiber (per 100g edible portion)



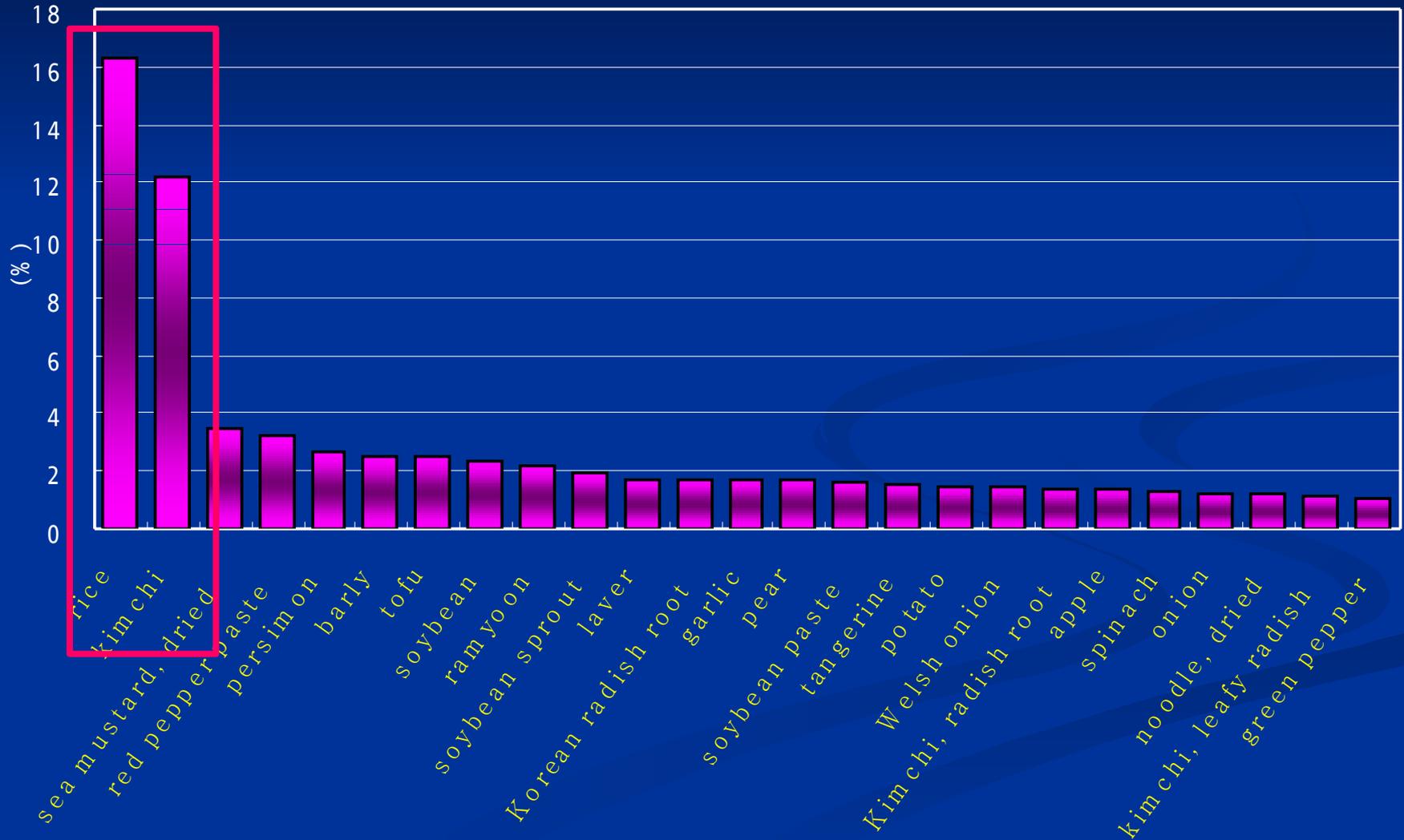
# Foods with high content of soluble dietary fiber (g/100g)

Food	Total Dietary fiber	Soluble dietary fiber	Insoluble dietary fiber
Barley	11.20	6.90	4.30
Sea mustard (dried)	43.43	6.83	36.60
Sea tangle (dried)	27.56	2.36	25.20
loaf bread	3.45	1.95	1.50
Sea lettuce	4.60	1.80	2.80
Buckwheat noodles (dried)	3.73	1.43	2.30
Sweet potatoes	3.76	1.36	2.40
flour	3.36	1.26	2.10
pumpkin	3.43	1.03	2.40
Perilla seed	7.90	1.00	6.90

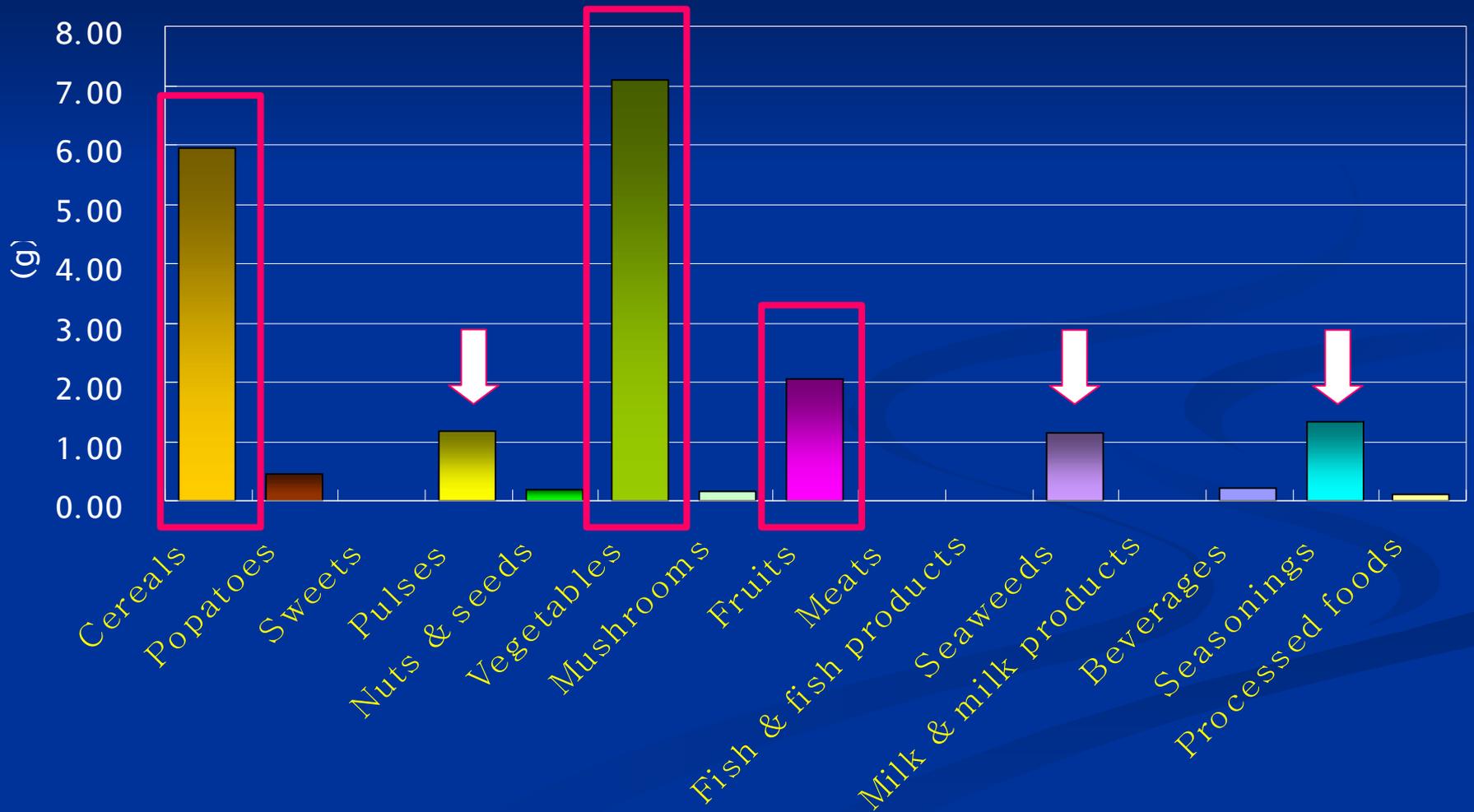
# Foods with high proportion of soluble dietary fiber (% of TDF)

Food	TDF (g/100g)	IDF (g/100g)	SDF (g/100g)	Ratio of Soluble fiber (% of TDF)
Dietary fiber drink	2.50	0.00	2.50	100.0
Garlic	5.90	1.60	4.30	72.9
Barley	11.20	4.30	6.90	61.6
Loaf bread	3.45	1.50	1.95	56.5
Rice	1.51	0.80	0.71	47.0
Tomato	1.34	0.80	0.54	40.3
Sea lettuce	4.60	2.80	1.80	39.1
Buckwheat noodles (dried)	3.73	2.30	1.43	38.4
Flour	3.36	2.10	1.26	37.6
Sweet potatoes	3.76	2.40	1.36	36.2
Soybean sprouts	2.55	1.70	0.85	33.3
Onion	1.47	1.00	0.47	31.9

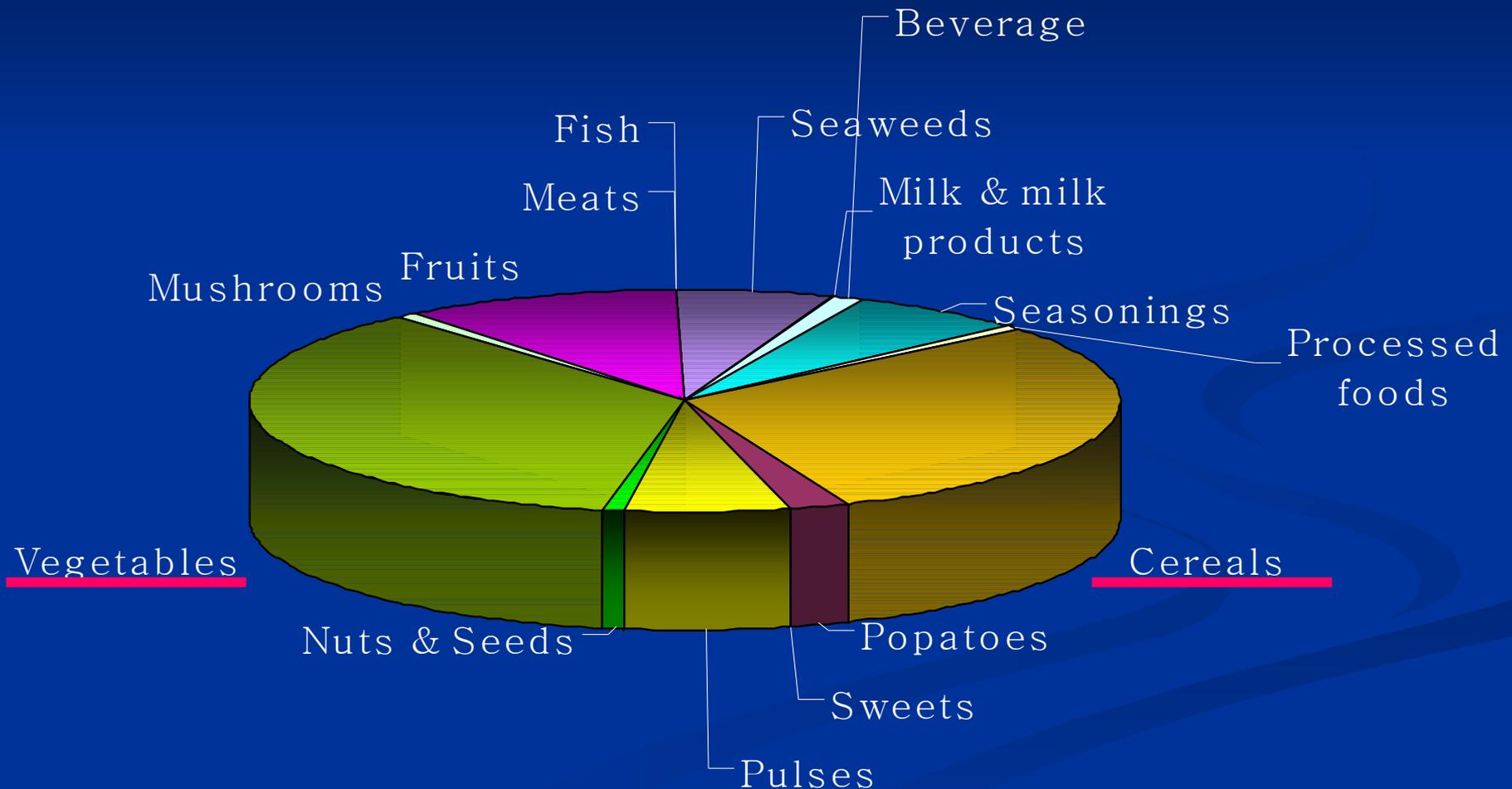
# Major source of dietary fiber for Korean population



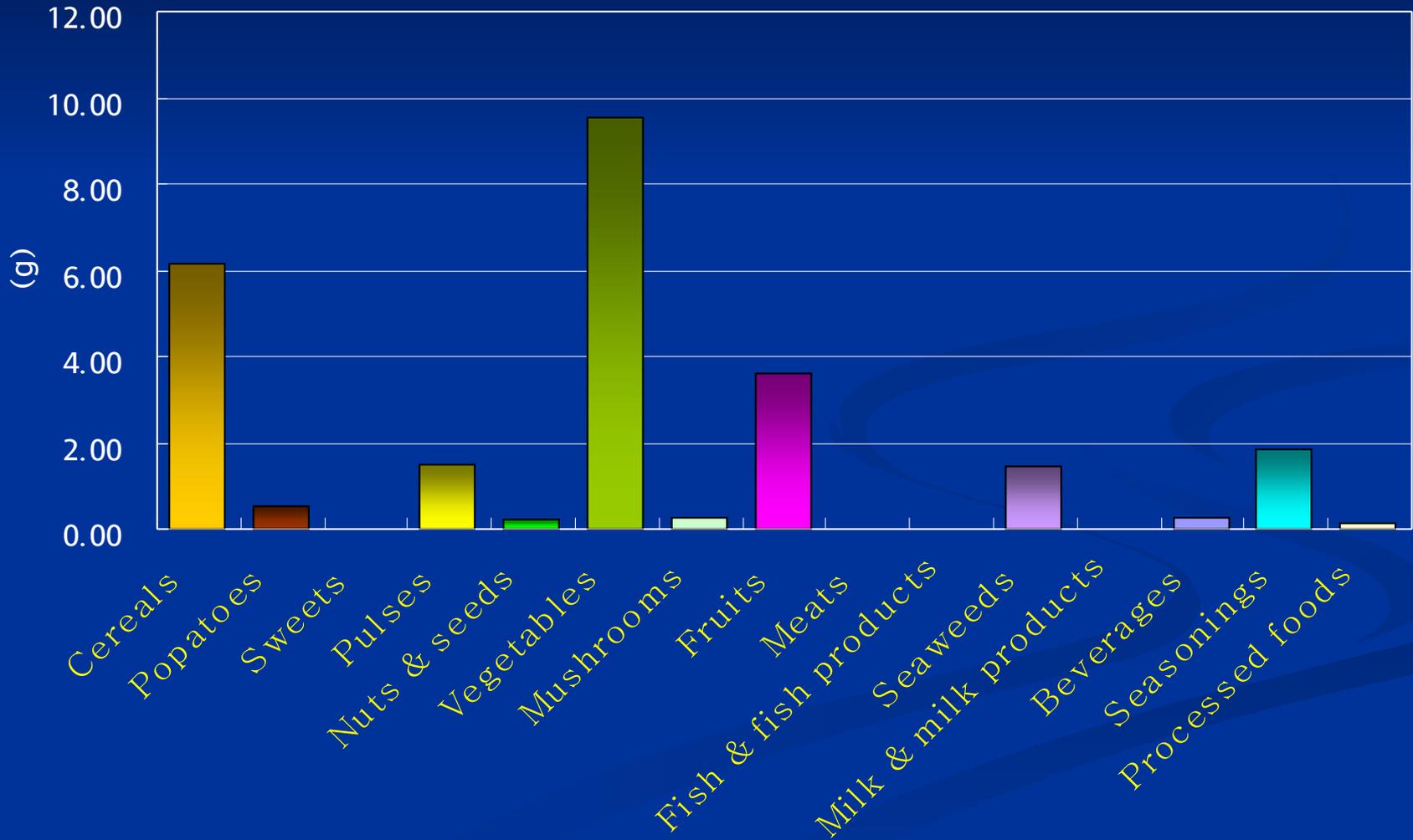
# Dietary fiber intake of Korean Population by food group



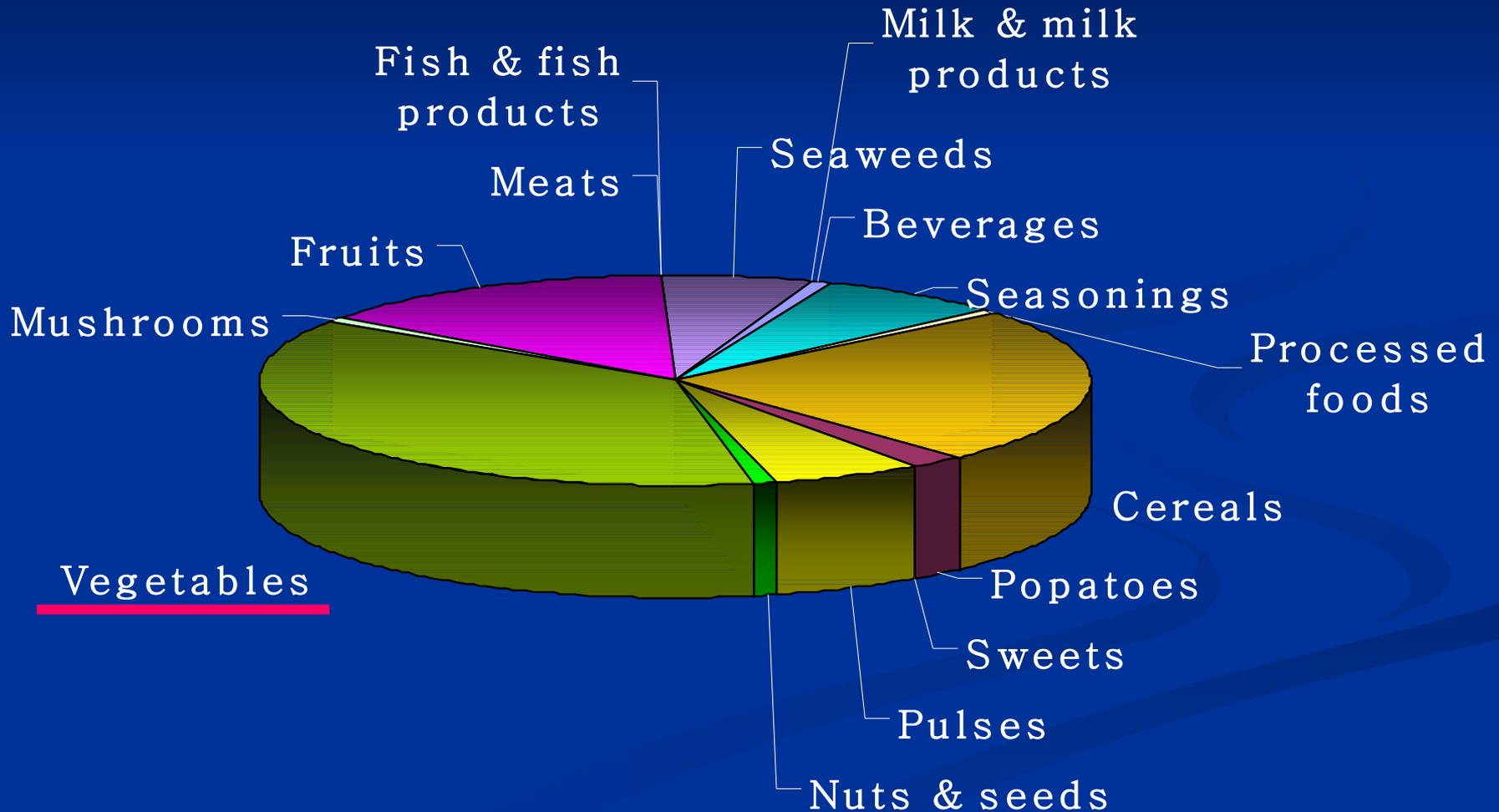
# Contribution of food groups on dietary fiber intake of Korean population



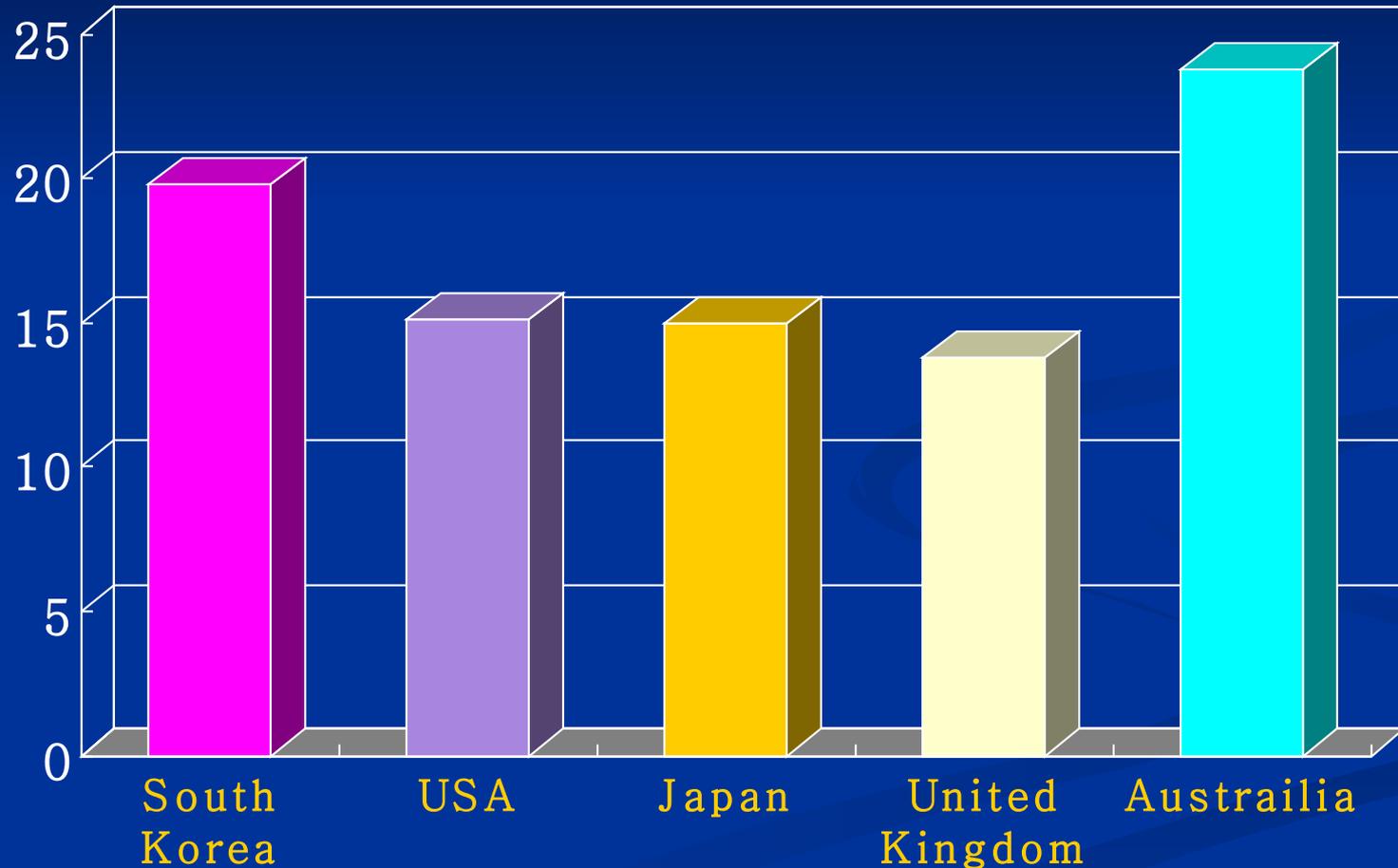
# Dietary fiber intake of Korean adults (30-49 yr) by food groups



# Contribution of food groups on dietary fiber intake of Korean adults (30-49yr)



# Dietary fiber intake comparison (per capita per day)



1) United Kingdom: adults, 19-64yr

2) Australia: adults, 25-64yr

# SIGNIFICANCE

- A Dietary fiber database on selected Korean foods was made available for the first time, after a systematic selection of foods and sound chemical analysis.

Continued...

- With this database, change in dietary fiber intake could be related to the change in chronic disease incidence/prevalence, and provide better understanding on the health effect of diet.
- ✉ **This study was supported by the Ministry of Health and Welfare with the Health Promotion Fund of 2005, Korea.**

Thank you