Regulations on Food with Function Claims in Korea

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International Symposium on Health/Funcional Claims in Foods with Focus on Nutrient Function Claims
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ILSI Taiwan, Taiwan FDA, MHW

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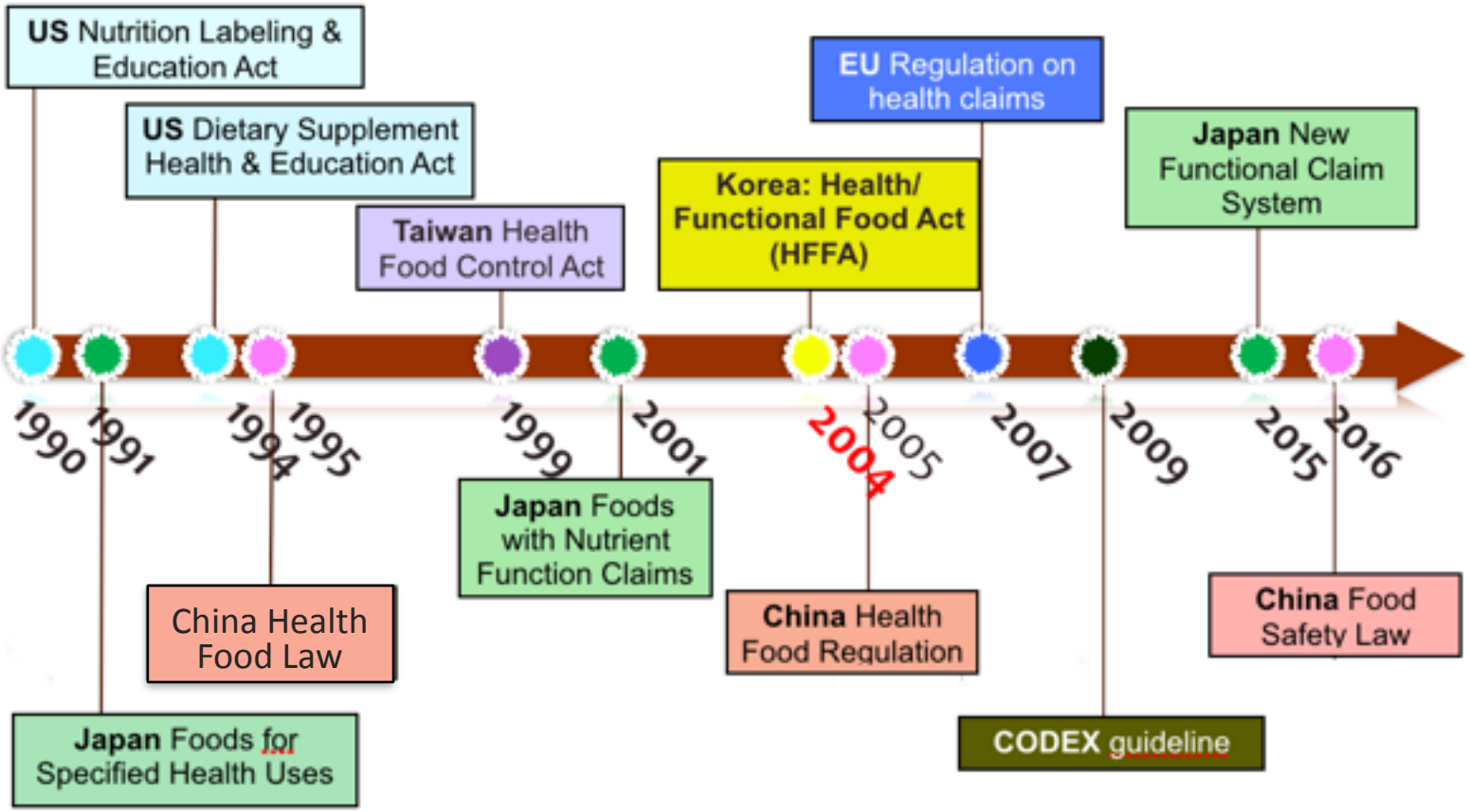
EWHA WOMANS UNIVERSITY

The regulation is necessary …

- To protect innovation in the **food industry**

- To ensure safety and not misleading claims for **consumers**
- Public health promotion



Topics to be presented

- Key features of the Health/Functional Food Act
- Clarification of function claims: from “nutrient function claims” to “reduction of disease risk claims”
- Scientific substantiation of function claims
- Function claims in other food categories
- Lessons learned from 10-year journey of HFFA

1 KEY FEATURES OF HEALTH/ FUNCTIONAL FOOD ACT (HFFA)

Article 3. Definition of HFFs

“ Foods containing functional ingredient(s), providing for maintenance, enhancement, and improvement of the health function of human body”

2004 Establishment

Narrowly defined as **food supplements** administered in small unit doses (tablet, capsule, powder, granule, pill or liquid).

2008 Revision

Extended to **equally apply to foods and food supplements**

Although functional foods may be developed in all food categories, a great majority of HFFs are in dietary supplement form

Article 14 & 15. Legal framework

Functional ingredients

Administration

Article 15.1

- Authorized by listing in ingredient monograph by regulatory amendments
- Longer track to market
- Open for anyone to use
- Less burden on manufacturer

Registration

Article 15.2

- Authorized by issuing a certificate without regulatory amendments (**120 days**)
- Requires applicants to provide technical dossier
- Encourage product innovation & investments in R&D

Consumer products

Notification

Article 14

- Requires notification of standards and specifications **5 days** before marketing.
- Inform authorities of market launch to allow monitoring

2 CLASSIFICATION OF FUNCTION CLAIMS

Substances that can have functional claims

- Nutrients

  vitamins, minerals, dietary fiber, protein, essential fatty acids

- Non-nutrients:

  (1) processed raw material originating from animal, plant, or microorganism

  (2) extract or purified substance of (1)

  (3) synthetic duplicate of (2)

  (4) a combination of (1),(2), and/or (3).

Function claims allowed for foods

- **Nutrient function claims**: Relate to the **physiological role** of the **nutrient** in growth, development and normal functions of the body
- **Structure function claims**: Relate to a **positive contribution to health**, to the improvement of function, or to modifying or preserving health **in the context of the total diet**
- **Disease risk reduction claims**: Relate to the **reduced risk of developing a disease** or health-related condition **in the context of the total diet**

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Very compatible with the health claims adopted by the international food standard authority, CODEX.

Examples of function claims

Substance (Food/ Constituent)	Health Benefit
Nutrient function claim	
Vitamin A	is **necessary** for vision adaptation in the dark
Other function claims	
Inulin/ Fructo-oligosacchs	Improves GI tract health
Salmon, tuna/ Omega 3 fatty acids	Helps to maintain healthy plasma TG level
Berries/ Anthocyanin	Boosts antioxidant capacity
Disease risk reduction claims	
Xylitol	Reduces the risk of **dental caries**
Vitamin Ca	Reduces the risk of **osteoporosis**

Data sources

- **Nutrient function claims**
  - Applied to the nutrients with own DRIs
  - Based on current, university-level nutrition texts

- **Other function claims** ***(Structure/function claims; General function claims; General level claims)***
  - Based on emerging scientific data (Intervention studies, Observation studies, animal studies, In vitro studies)

- **Disease risk reduction claims** ***(Health claims; High level claims)***
  - Based n significant scientific agreement among experts in related area (Intervention studies and Observation studies)

List of nutrient function claims (1)

- **Vitamin A (210~1,000 ug RE/d)**
  - Necessary for vision adaptation in dark places
  - Necessary for the normal structure and function of skin and mucosa
  - Necessary for normal growth and development of epithelial cells.
- **Beta-carotene (0.42 ~ 7 mg/d for oil extract & synthetic compounds: >1.26 mg/d)**
  - Necessary for vision adaptation in dark places
  - Necessary for the normal structure and function of skin and mucosa
  - Necessary for normal growth and development of epithelial cells.
- **Vitamin D (1.5~10 ug RE/d)**
  - Necessary for normal absorption/utilization of calcium & phosphorus
  - Necessary for normal structure and maintenance of bones
- **Vitamin E (3~400 mg a-TE/d)**
  - Necessary for protection of cells from free radicals
- **Vitamin K (16.5~1000 ug/d)**
  - Necessary for the normal blood coagulation
  - Necessary for the normal bone structure
- **Vitamin B1 (0,3~100 mg/d)**
  - Necessary for the normal carbohydrates and energy metabolism

List of nutrient function claims (2)

- **Vitamin B2 (0.36~40 mg/d)**
  - Necessary for energy production in the body
- **Pantothenic acid (1.5~2000 mg/d)**
  - Necessary for the normal metabolism of lipids, carbohydrates, and proteins and energy production
- **Vitamin B6 (0.45~67 mg/d)**
  - Necessary for utilization of proteins and amino acids
  - Necessary for maintenance of normal blood homocysteine levels
- **Folic acid (75~400 ug/d)**
  - Necessary for normal structure of cell and blood
  - Necessary for normal development of fetal neural tube
  - Necessary for maintenance of normal blood homocysteine levels
- **Vitamin B12 (0.3~2000 ug/d)**
  - Necessary for normal metabolism of folic acid
- **Biotin (9~900 mg/d)**
  - Necessary for normal metabolism of lipids, carbohydrates, and proteins, and energy production

List of nutrient function claims (3)

- **Vitamin C (30~1000 mg/d)**
  - Necessary for normal structure and maintenance of connective tissue
  - Necessary for absorption of iron
  - Necessary for protection of cell from free radicals
- **Calcium (210~800 mg/d)**
  - Necessary for normal structure of bones and teeth
  - Necessary for normal function of nerve and muscle
  - Necessary for normal coagulation of blood
  - Intake of enough calcium with an appropriate exercise and healthy dietary habits prior to adolescence may reduce the risk of osteoporosis
- **Magnesium (66~250 mg/d)**
  - Necessary for normal energy utilization
  - Necessary for normal maintenance of the nerve and muscle
- **Iron (4.5~15 mg/d)**
  - Necessary for oxygen transport and blood production in the body
  - Necessary for energy production
- **Zinc (3.6~12 mg/d)**
  - Necessary for normal immune function
  - Necessary for normal cell division

List of nutrient function claims (4)

- **Copper (0.45~7 mg/d)**
  - Necessary for transport and utilization of iron
  - Necessary for protection of cell from free radicals
- **Selenium (15~135 ug/d)**
  - Necessary for protection of cell from free radicals
- **Iodine (22.5~150 ug/d)**
  - Necessary for synthesis of thyroid hormone
  - Necessary for energy production
  - Necessary for development of the nerve system
- **Manganese (0.6~3.5 mg/d)**
  - Necessary for normal bone structure
  - Necessary for energy utilization
  - Necessary for protection of cell from free radicals
- **Molybdenum (7.5~230 ug/d)**
  - Necessary for activity of oxidase and reductase
- **Potassium (1.05~3.7 g/d)**
  - Necessary for water and electrolyte balance in the body

List of nutrient function claims (5)

- **Dietary fiber (>5 g/d)**
  - Supplementation of dietary fiber
- **Protein (>12 g/d)**
  - Components of the physical tissues such as muscle and connective tissue
  - Necessary for normal formation of enzymes, hormones, and antibodies
  - Necessary for the transport and storage of essential nutrients or active materials in the body
  - Necessary for the balance maintenance o fluid and acid-base balance
  - Necessary for the synthesis of energy, glucose, and lipid
- **Essential fatty acids (>4 g/d for linoleic acid; >0.6 g/d for linolenic acid)**
  - Supplementation of essential fatty acids

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Non-nutrients

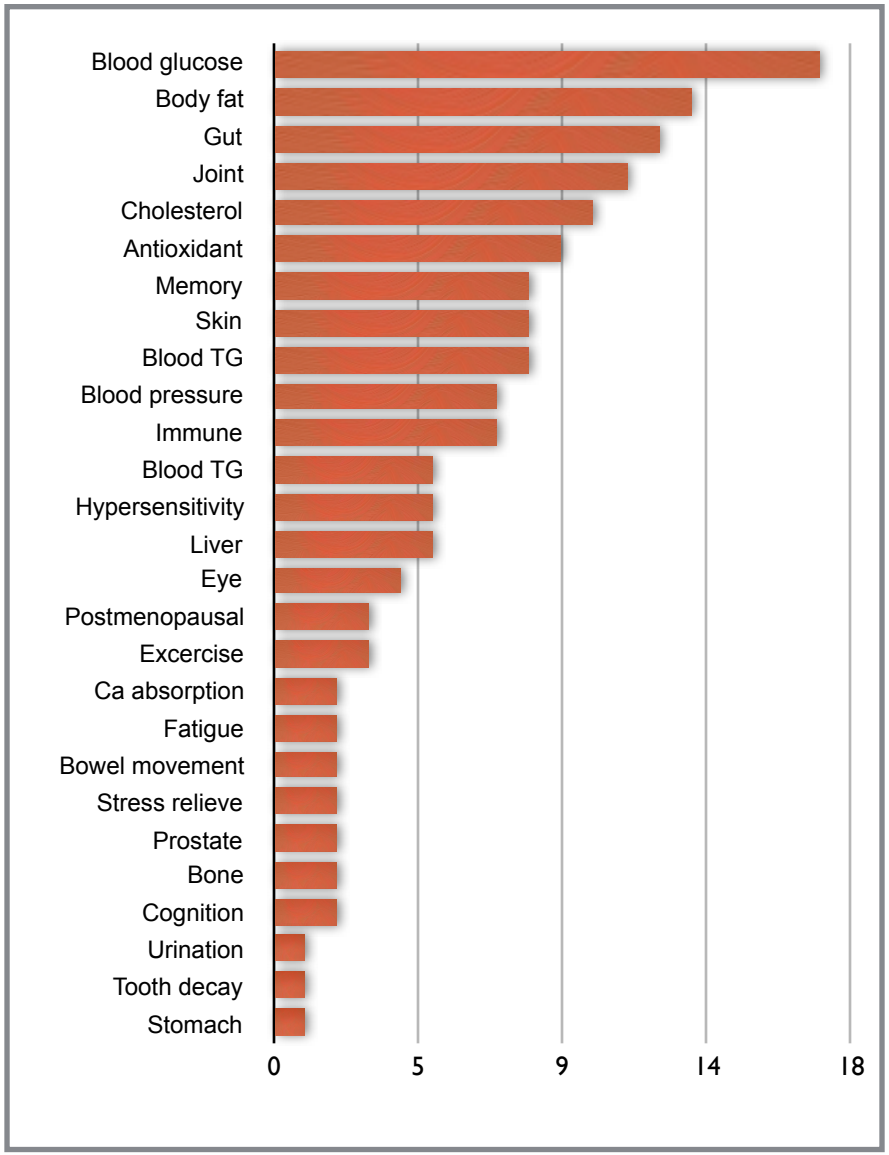
Probiotics

- Lactobacillus, Lactococcus, Enterococcus, Streptococcus, Bifidobacterium
- L. plantarum CJLP133)
- L. sakei probio65
- VSL#3

Botanicals (117)

Other substances (84)

- Single components (CoQ10, glucosamine)
- Fish (omega-3-fatty acids, sardine peptide)
- Animal (collagen, squalene)
- Algae (chlorella, spirulina)



3 SCIENTIFIC SUBSTANTIATION OF FUNCTION CLAIMS

Evaluation of new functional ingredients (non-nutrients)

- HFFA gives the **Ministry of Food & Drug Safety (MFDS)** the exclusive authority to evaluate the safety and effectiveness of the functional ingredients of HFFs.
- HFFA also gives **the applicant** the responsibility to provide all relevant documents for backing up the safety and the claims of their products

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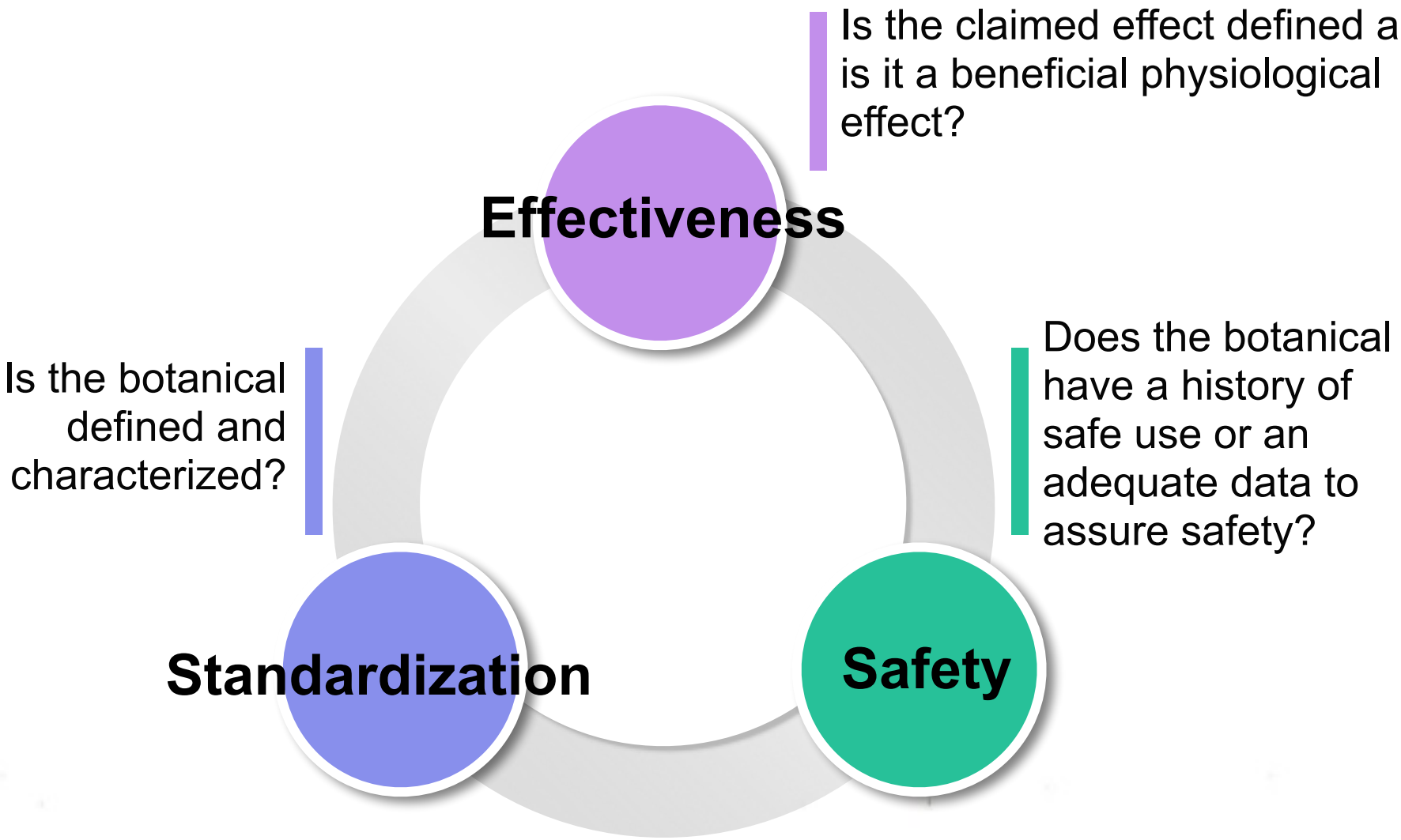
The golden triangle



1. Standardization

Is the functional ingredient produced using a preparation that is consistent in terms of chemical composition and effectiveness?

1. Raw material:
Genus and species; parts; common name; Latin binomial form

Angelica (*Angelica gigas*)
Root, domestic

2. Manufacturing process

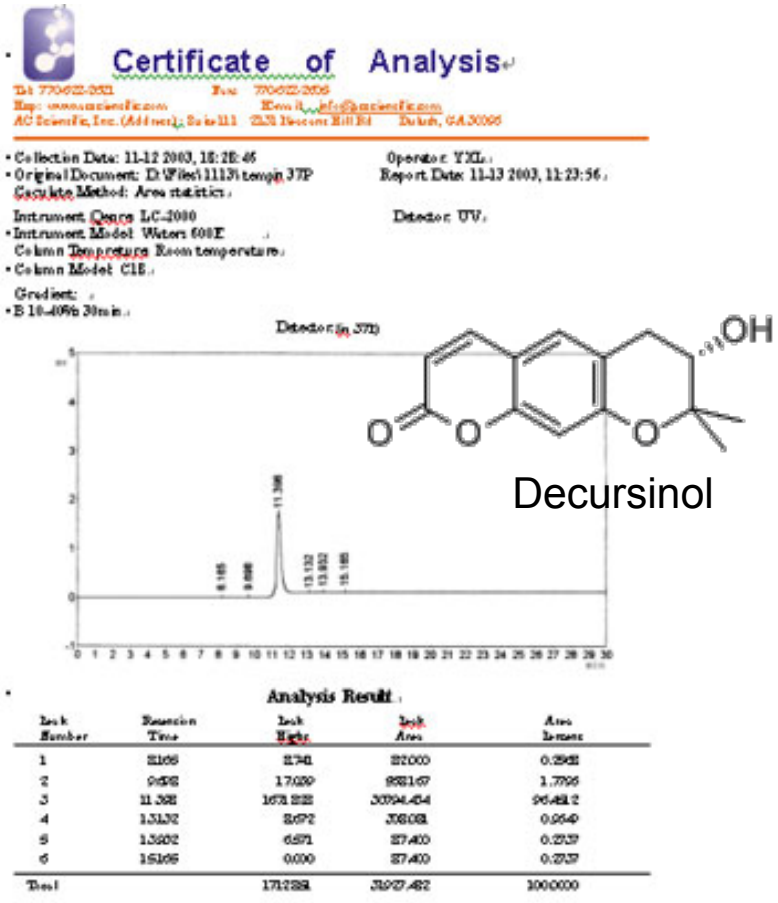
70% EtOH extraction

Filtration

Concentration, 3X

Yield: 10%

3. Identification of an active/marker compound

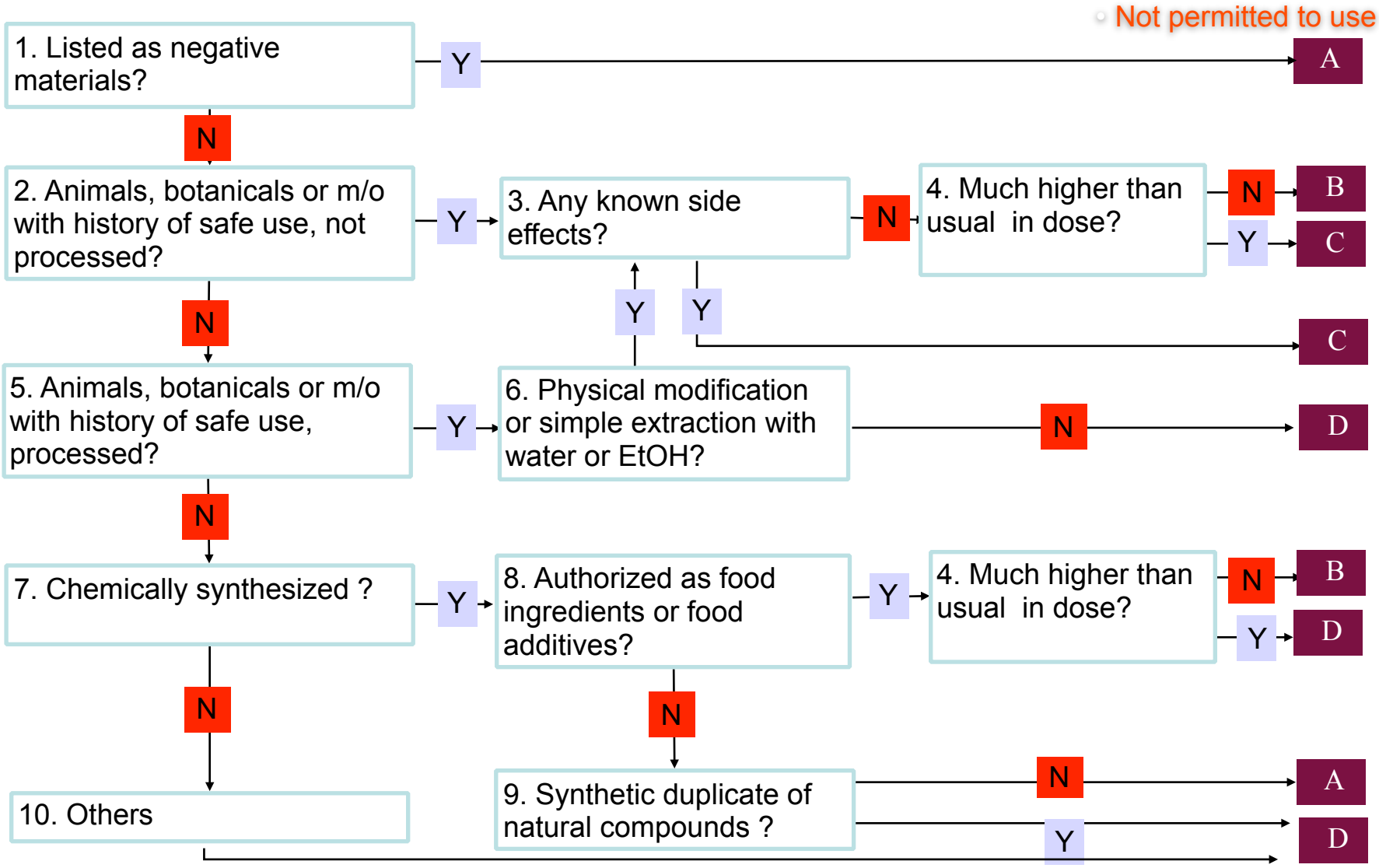


2. Safety

Does the functional ingredient have a history of safe use or an adequate data to assure safety?

- **For pre-market evaluation**
  - A **negative list** of ingredients that are considered unsuitable for use on in botanical supplements (67 botanicals including Ephedra, Yohimbee)
  - **Tiered approach** for safety assessment
    - ✓ Sometimes a full assessment can be needed: the more a preparation deviates from the traditional use.
    - ✓ In other cases, a full safety assessment seems not to be always required when risk management measures can be adopted based on the available body of knowledge.
  - A **decision tree** was developed to identify the data required and corresponding management measures taking into consideration the challenges raised by the MFDS.
- **For post-market evaluation**
  - Adverse event monitoring

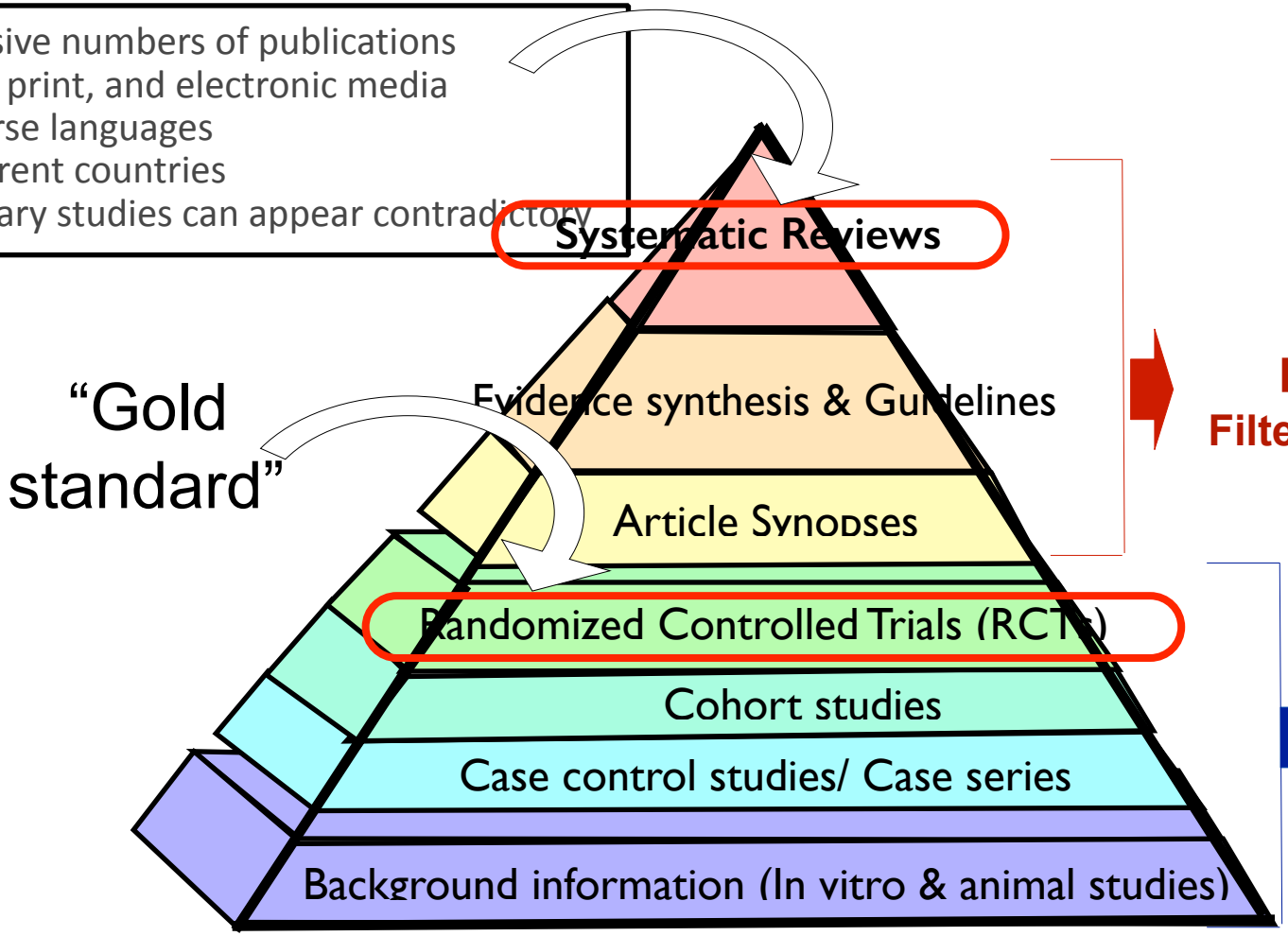
Decision tree approach (pre-market)



3. Scientific substantiation of function claims

Is the claimed effect defined and is it a beneficial physiological effect?

- Massive numbers of publications
- Both print, and electronic media
- Diverse languages
- Different countries
- Primary studies can appear contradictory

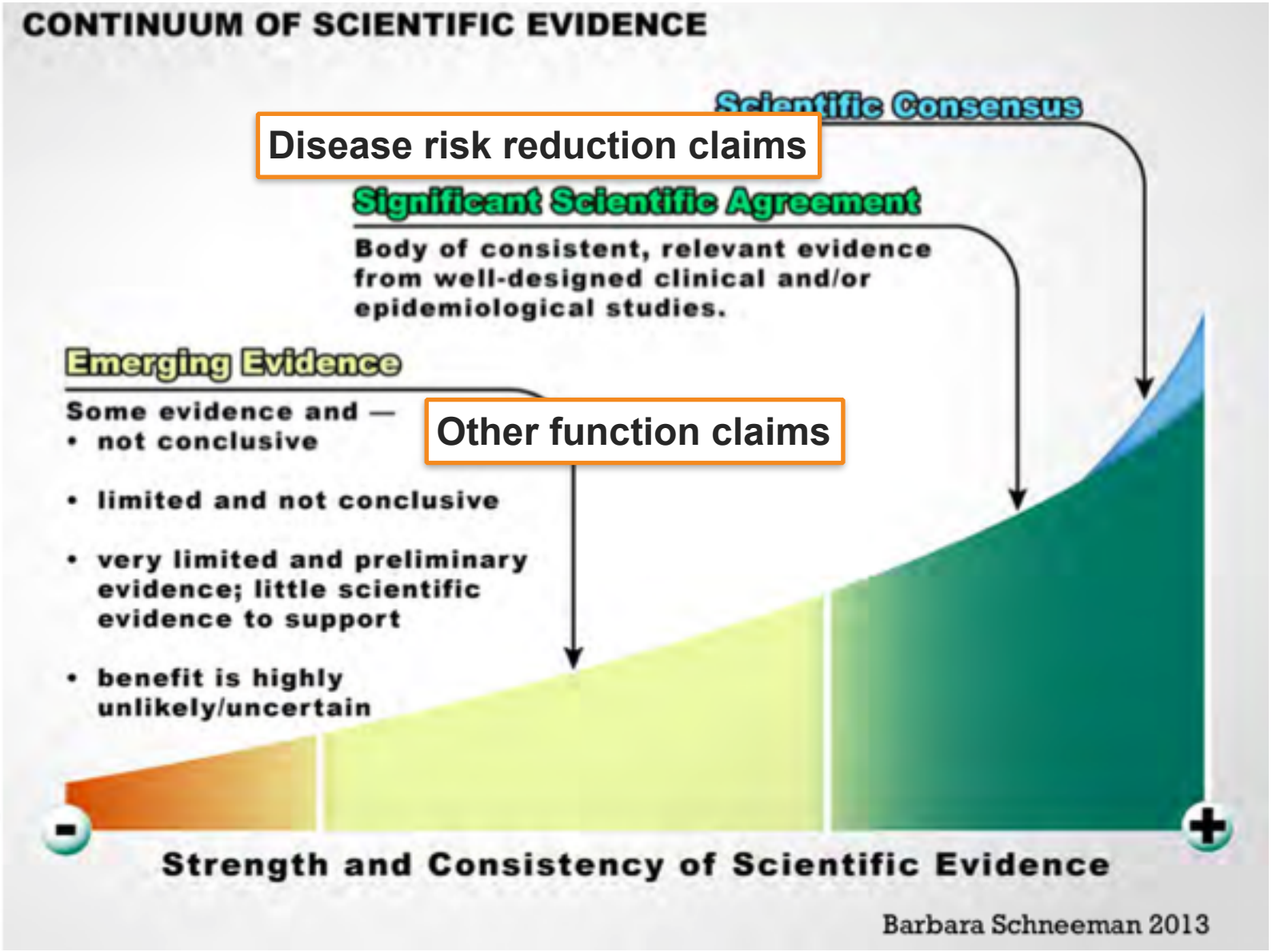


"Gold standard"

Evaluation:
Filtered Information

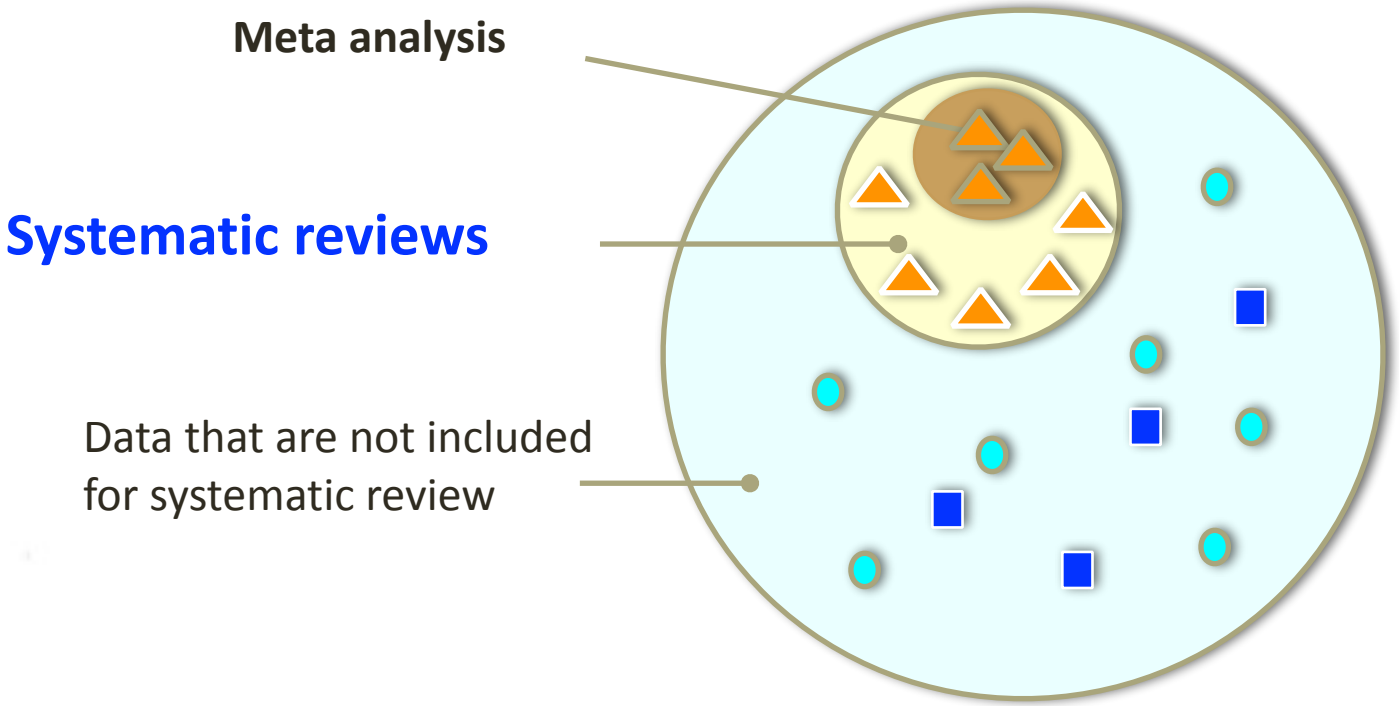
Data sources:
Un-filtered Information

Emerging Evidence

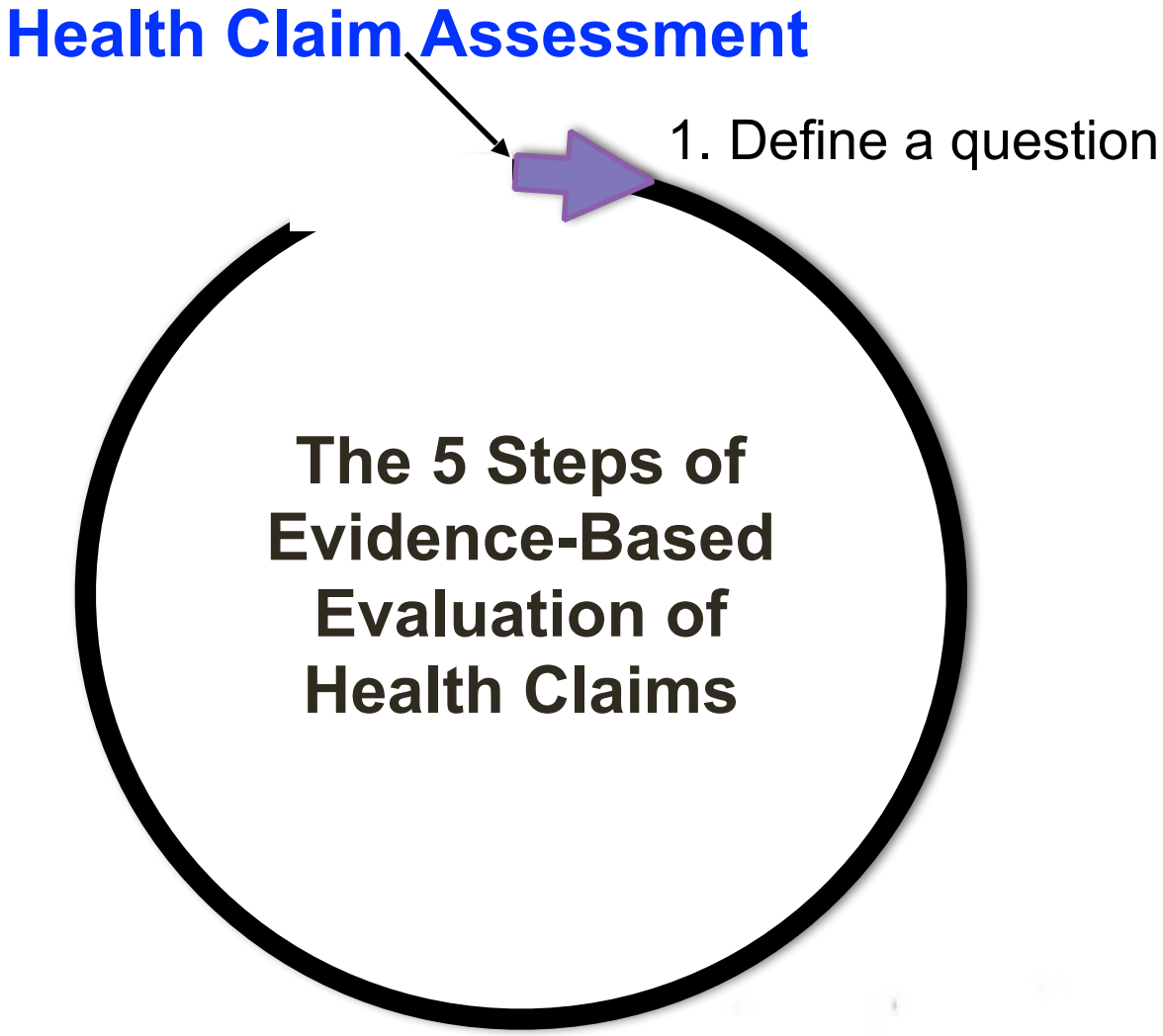


Evaluation: filtered information

- A **systematic review** provides an overview of primary studies which contain an explicit statement of objectives, materials, and methods and has been conducted according to explicit and reproducible methodology.
- A **meta analysis** is a mathematical synthesis of the results of two or more primary studies that addressed the same hypothesis in the same way (**i.e. a specific type of systematic review**).



Steps of Systematic Review



Steps of Systematic Review

Health Claim Assessment

1. Define a question

The 5 Steps of Evidence-Based Evaluation of Health Claims

2. Search the studies

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Steps of Systematic Review

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4. Combine the results

The 5 Steps of Evidence-Based Evaluation of Health Claims

Steps of Systematic Review

Health Claim Assessment

1. Define a question

2. Search the studies

3. Assess the studies

4. Combine the results

5. Put the findings in context

The 5 Steps of Evidence-Based Evaluation of Health Claims

2. Search the literature (1)

- Finding **published primary** studies
  - Breaking down the study question into components by Key words
  - Use of synonyms & wildcard symbol
  - Snowballing
    - ✓ Refine keywords using bibliographies and citation search
    - ✓ Repeat the whole procedures using the new keywords identified
  - Hand searching
  - Use of different databases

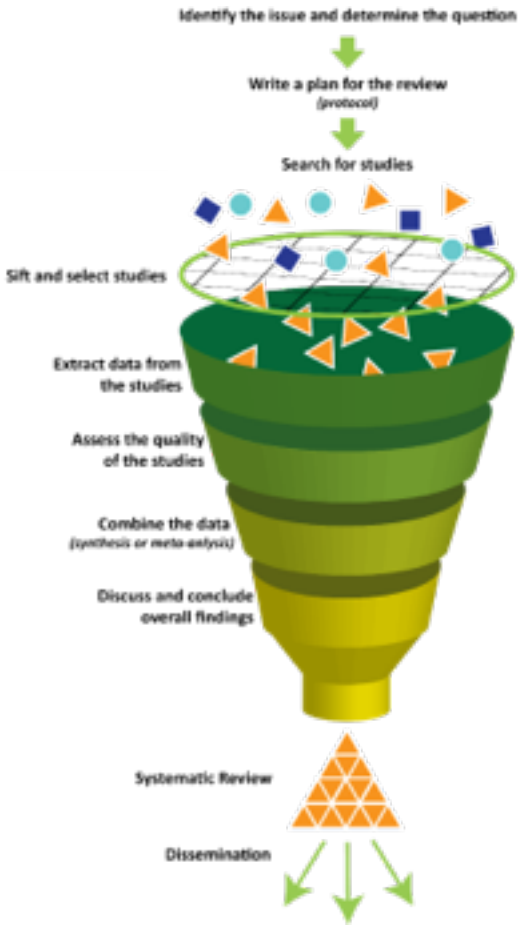
2. Search the literature (2)

- Finding **unpublished primary** studies
  - Searching relevant databases
  - Writing to experts

- Publication bias
  - 'Positive' studies are more likely to be published than 'negative' studies
  - Duplicate publications
    - ✓ If duplicate publications represent several updates of the data, then the most recent should be used.

3. Assess the studies

- At least two reviewers
  - Read and score independently, meet to resolve any discrepancies by open discussion
- Do the appraisal ‘blind’
  - Remove identification of authors & journal
- Decision to include/exclude the study



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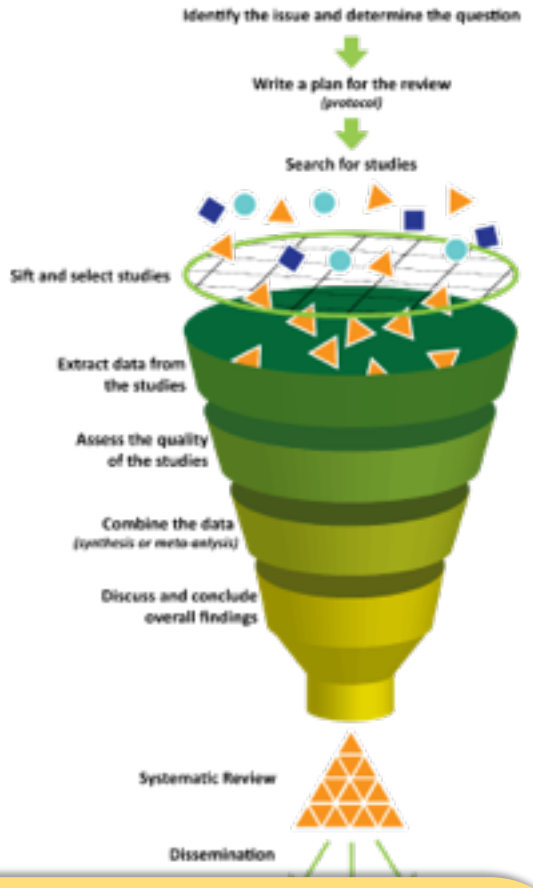


- Studies carried out with the food/constituent for claim
- Appropriate outcome measures for the claimed effect
- Conditions for studies comparable to condition of use for claim
- Study groups representative of the target group or extrapolation to the target population possible

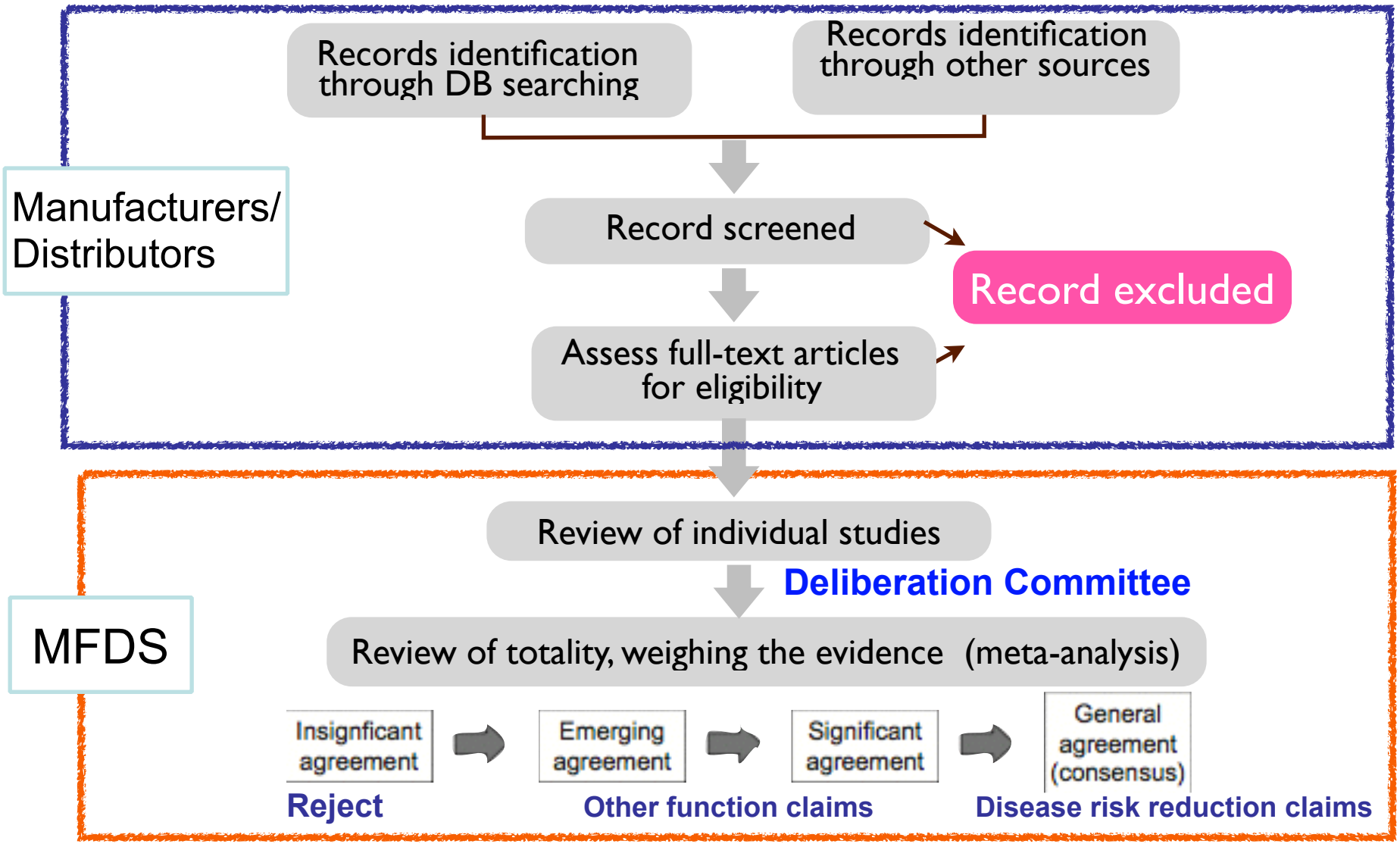
4. Combine the results

- Synthesis of study results
  - Generally not advisable to pool the results of the individual studies as if they were one common large study
  - Common metric (unit)/ discrete measures vs continuous measures

5. Put the findings in context

- Return to the original question & assess how well it is answered by the current evidence
  - How important are study design flaws in the interpretation of the overall results?
  - Is publication bias an important issue?
  - If further research is needed, then specific suggestions should be made about the necessary design features rather than a simple call for more data.

Process of evaluation (summary)



4 FUNCTION CLAIMS IN OTHER FOOD CATEGORIES

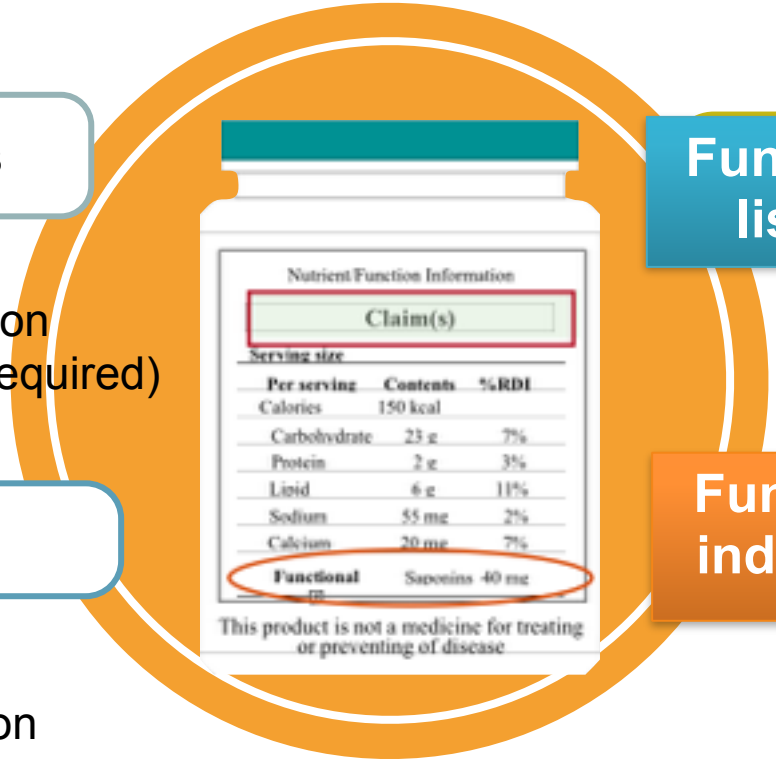
Composition of HFFs

Food ingredients

- Positive listing
- Food ingredient petition (History of safe use required)

Food additives

- Positive listing
- Food additives petition (Significant safety evidence required)



Functional ingredients listed in FHH Code

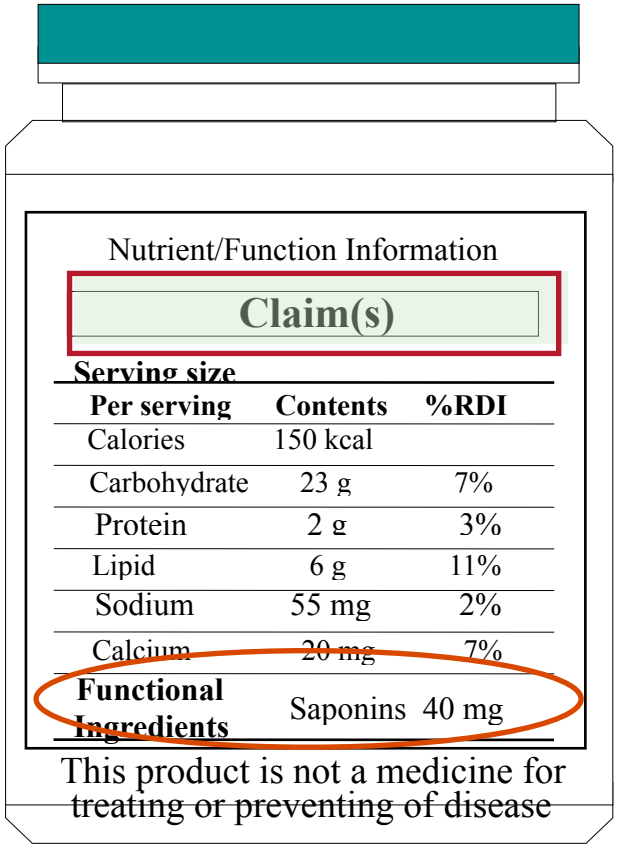
- 28 nutrients
- 56 non-nutrients

Functional ingredients individually registered

- 175 non-nutrients

~15,000 products/year

Access to market



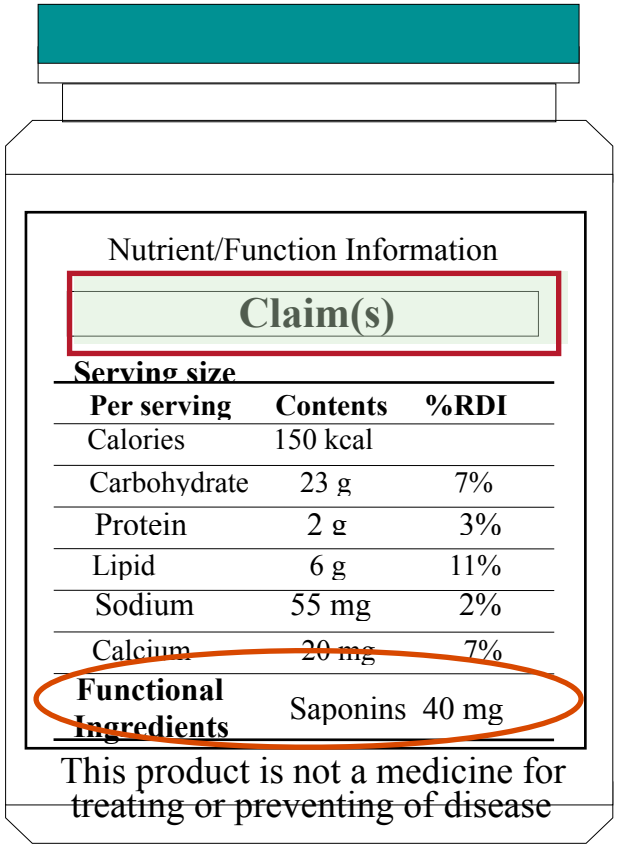
Step 1 Authorized functional ingredients

Step 2 Notification of standards/spec for final products

Step 3 Pre-market review of labeling & advertisement

Step 4 Adverse event reporting and signal generation

Access to market



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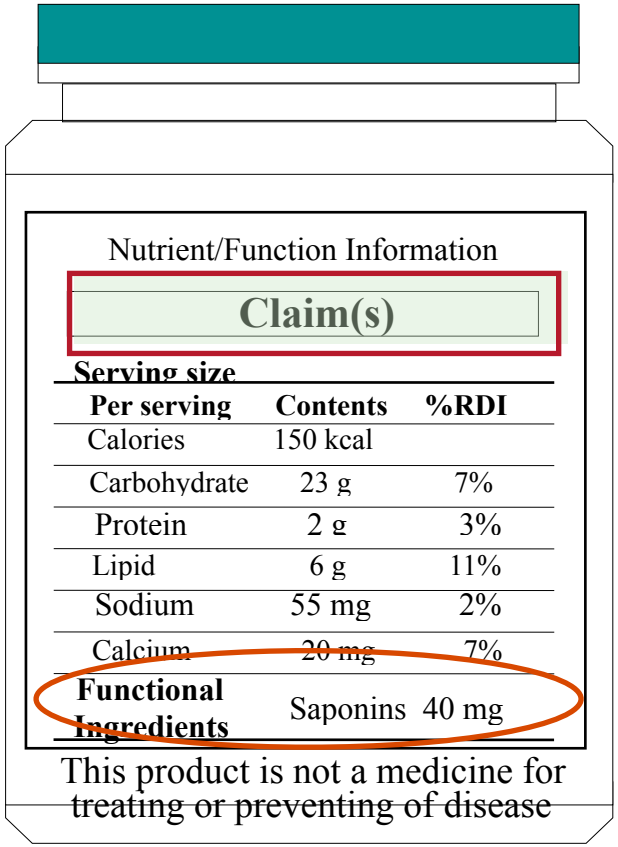

Step 1 — Authorized functional ingredients

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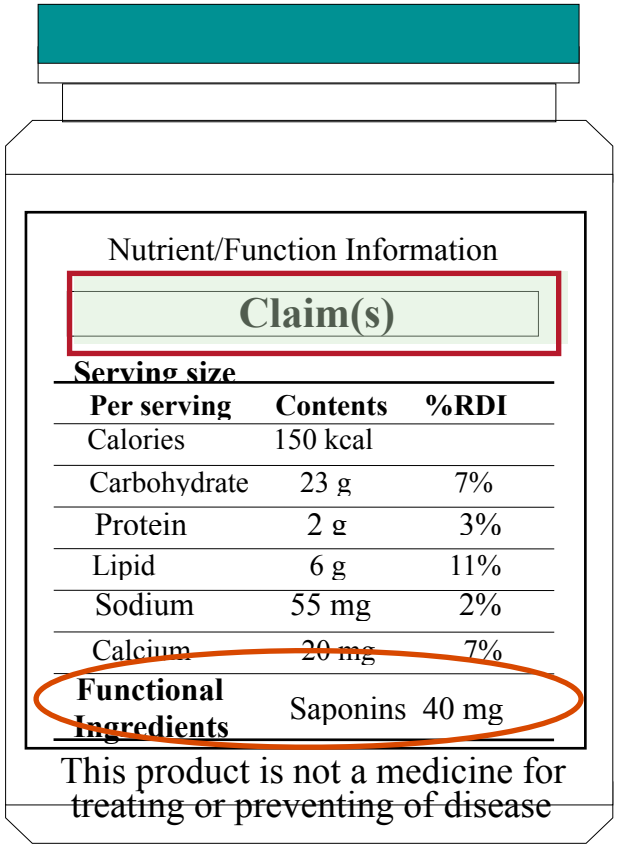

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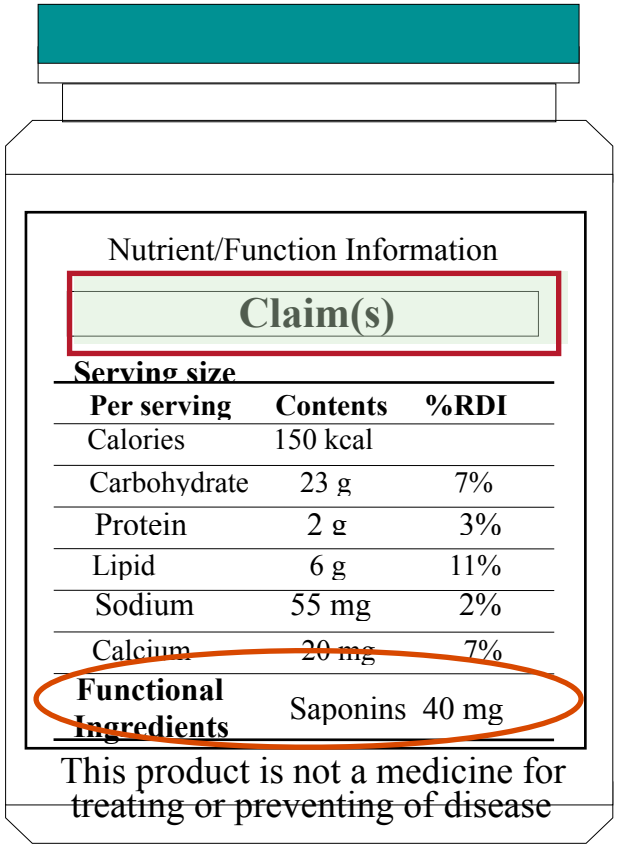

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Health-related Food Categories

Health/Functional Food Act

Since 2004

★ **Health/functional foods**

Food Sanitation Act

Since 1962

★ **Foods for special dietary uses**

★ **Medical foods**

- Functional foods and food supplement are regulated under "**Health/Functional Food Act**" since 2004.
- Other food categories including foods for special dietary uses and medical foods are still remained under the "**Food Sanitation Act**".

Nutrient content claims vs function claims

Food sanitation act → **Health/functional food**

Nutrition claims

What the product contains?

Nutrient content claims
(low, high, free, source of)

Comparative claims
(increased, reduced, light, ...)

Nutrient Reference Values

Health claims

What the product does?

Nutrient function claims

Relate to the physiological role of the nutrient in growth, development and normal functions of the body

Other function claims

Relate (1) to a positive contribution to health, (2) to the improvement of a function, or (3) to modifying or preserving health, in the context of the total diet

Reduction of diseae risk claims

Relate to the reduced risk of developing a disease or health-related condition, in the context of the total diet

Evidence based evaluation of functional ingredients

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Evidence based evaluation of functional ingredients

5 LESSONS LEARNED FROM 10-YEAR JOURNEY OF HFFA

Success

Successful implementation of NEW regulation

- Clear regulatory framework, detailed technical guidelines, and decision tree
- Transparent communication with related stakeholders
- Well balanced approach – positive, negative, individually registered system

Win-Win for both Industry & Consumers

- Strengthening industry competitiveness via new technology development
- Gaining relatively high credibility about efficacy from consumers
- Reducing consumer misleading activities
- Securing right to choose based on product claims

Alignment with Global Evaluation Scheme

- Systematic review based on strength of science evidence

Challenges

Tackling adulteration

- Important to identify economically-motivated adulteration
- Critical to prevent/identify mix-ups (esp. toxic botanicals)
- Identifying testing is required as part of cGMPs.

Evaluation of emerging science and claims

- Acceptance of new biomarkers in the line of emerging science
- Translation of science (biomarkers) to claims, allowing differentiation among products by claims

Cost-benefit analysis

- In some areas, the relationship between botanical supplements and particular health outcomes becomes fairly clear.
- Then, it is necessary to estimate potential health care cost savings resulting from the daily intake of botanical supplement in older individuals.

Challenges: tackling adulteration

Tetanrda root (*Stephania tetranadra*)

Dutchman's pipe (*Aristolochia fangchi*)

Cynanchum wilfordii

Digitalis purpurea ("Foxglove")

Symphytum officinale ("Comfrey")

Cynanchum auriculatum

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