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A REGULATORY OVERVIEW ON NUTRACEUTICALS AND REGULATORYCOMPILANCES IN INDIA AND USA

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ABSTRACT

Nutraceutical is a combination of "Nutrition" and "Pharmaceutical". In today's era of increased expectations and standards of lifestyle, there has been a constant demand for supplements other than food and medicines. Nutraceuticals are any food or part of food that has nutritional and medicinal benefits such as prevention and remedy of disorder. The fortified meal products with changing lifestyle and related issues, functional supplements like vitamins, proteins, fatty acids, minerals, amino acids, and probiotics also became a part of this category. All the regulatory authorities are focusing on the quality and safety of these products which are meant to be used or consumed by humans. Regulatory authorities are converging on such products and reach from one country to another in compliance with respective guidelines set by the Regulatory team of the particular country. This article mainly aims at the regulatory work for Nutraceuticals in India and the US.

KEYWORDS: Nutraceutical, Regulatory work, USA, India, Regulatory authorities, Regulatory work.

INTRODUCTION

A Nutraceutical word comprises of 'Nutrient' and 'Pharmaceuticals'. According to AAFCO (The Association of American Feed Control Officials), 1996, 'Nutrient' means a feed constituent in a form and at a level that will help, support a life of human being or animal while 'Nutraceutical' means any non-toxic food component that has scientifically proven health benefits including prevention and treatment of diseases. Products isolated or purified

from food are sold in medicinal forms not usually associated with food. A Nutraceutical has the physiological benefit that it protects against chronic diseases.[1]

The term "nutraceutical" was coined from "nutrition" and "pharmaceutical" in 1989 by Stephen DeFelice, MD, founder and chairman of the Foundation for Innovation in Medicine (FIM), Cranford, NJ. According to DeFelice, nutraceutical can be defined as, "a food (or part ofa food) that provides medical or health benefits, including the prevention and/or treatment of a disease."[2]

A nutraceutical is any substance considered as a food or its part which, in addition to its normal nutritional value provides health benefits including the prevention of disease or promotion of health. Due to the adverse effects of drugs, consumers are preferring food supplements to improve health. This brought a revolution worldwide in the field of Nutraceuticals.

Nutraceuticals provide extra health benefits, in addition to the basic nutritional value found in foods. Depending on the jurisdiction, products may claim to prevent diseases, improve health, delay the aging process, increase life expectancy or support the life structure or function of thebody.

Nutraceutical is a broad term used to describe any product derived from food sources that provide extra health benefits along with nutritional value found in foods. These products contains carbohydrates, lipids, proteins, vitamins, minerals, and other necessary nutrients. The most common type of nutraceutical product is dietary supplements.

A dietary supplement is a liquid or capsule version of nutrients found in foods and is taken as an additional supplement to the daily diet. Amino acids, vitamins, minerals, botanicals, and herbs are all forms of dietary supplements. Amino acids help to build muscle and improve muscle function. Vitamin B6 and B12 along with folic acid play an important role in the prevention of cardiovascular disease.

Vitamin D strengthens bones & prevents osteoporosis and reduces certain types of cancers. Minerals such as calcium also strengthen bones and help in the prevention of osteoporosis. Herbs such as St. John's wort is used to relieve stress or depression, and also act as a stimulant like tea, coffee and chocolate.

Botanical dietary supplements are usually taken in the form of tea which acts as a stimulant or relaxant. Functional foods are another form of nutraceutical products. Instead of taking a dietary supplement, functional foods are enhanced with nutrients and eaten normally. The two categories of functional foods are processed food and fermented foods.[3]

Nutraceuticals, in contrast to pharmaceuticals, are substances, which usually have not patent protection. Both pharmaceutical and nutraceutical compounds might be used to cure or prevent diseases, but only pharmaceutical compounds have the governmental sanction.[4]

About 2000 years ago, Hippocrates correctly emphasized “Let food be your medicine and medicine be your food". Currently, there is an increased global interest due to the recognition that “Nutraceutical” play a major role in health enhancement. "Pharmaceuticals” may be considered as drugs used mainly to treat diseases, while “Nutraceutical” are those that are intended to prevent diseases.

The majority of the Nutraceuticals do possess multiple therapeutic benefits, however, in the present review; much effort has been devoted to decentralize them based on their disease-specific major indication. Nutraceuticals have been claimed to have a physiological benefit or provide protection against the following diseases (and/or found to act as):

- Cardiovascular agents
- Anti-obese agents
- Antidiabetics
- Anticancer agents
- Immune boosters
- Chronic inflammatory disorders
- Degenerative diseases[5]

The word Nutraceutical is generally used in the marketing world but has no regulatory definition. The phrase is applied to products that range from isolated nutrients, dietary supplements and herbal products, specific diets, and processed foods such as cereals, soups, andbeverages.

Data collected from 2003 to 2006 by the National Health and Nutrition Examination Survey (NHANES) that covered all types of dietary supplements indicate that at least one dietary supplement, largely multivitamin/multimineral products were taken by 53 percent of

Americanadults. US Women were more likely than men to take dietary supplements.

Current scenario

The Pharma companies like Novartis, GlaxoSmithKline, and Cadila healthcare have stepped into the dietary supplement industry in recent years. The FMCG (fast-moving consumer goods) suppliers and pharmaceutical companies are the key players in the Indian Nutraceutical market. Vitamin and Mineral supplements are responsible for 64% of the total Nutraceutical market in India.

Laws governing Nutraceuticals

There are varieties of laws governing Nutraceutical in different names according to the country. The name even differs from region to region from Nutraceutical to dietary supplements and some countries include Nutraceutical under the food umbrella. In general, dietary supplement is a substance that is administered orally that is made up of a dietary ingredient that is meant to be the addon for the diet. Several definitions and terms are used worldwide to denote Nutraceutical they are like Dietary supplement in the USA, Canada calls it Natural Health Product, Australia uses the term Complementary medicines, European Union denotes it by the word Food Supplements, and in India, it is known as Foods for Special dietary use.

Dietary Supplement Health Education Act (DSHEA): 1994

This act is introduced in the Senate by Senator Orrin. G. Hatch, this law defines the dietary supplement and the legal requirements necessary for the marketing of dietary supplement products in the US. The law defines a dietary supplement as follows; a dietary supplement is aproduct that contains one or more of the following dietary ingredients:

- Vitamin;
- Mineral;
- Herb or another botanical;
- Amino acid;
- A dietary substance for use by humans to supplement the diet by increasing the total dietary intake of that ingredient; and
- A concentrate, metabolite, constituent, extract, or combination of any of the above.
- DSHEA also states that dietary supplements must be products that are intended for oral administration.

Food Safety and Standards Act (FSSA): 2006

This act is laid down in 2006 to form the statutory body FSSA which regulates the manufacture,storage, distribution, sale, and import, to ensure the availability of food and food products within the country. Nutraceuticals are grouped under the umbrella of Foods by the FSS act 2006, rules and regulations 2011. Section 22(1) of FSSA, defines "foods for special dietary uses or functional foods or Nutraceutical or health supplements" as:

a. Foods which are specially processed or formulated to satisfy particular dietary requirements which exist because of a particular physical or physiological condition or specific diseases and disorders and which are presented as such, wherein the composition of these foodstuffs must differ significantly from the composition of ordinary foods of comparable nature, if such ordinary foods exist, and may contain one or more of the following ingredients, namely:

- Plants or botanicals or their parts in the form of powder, concentrate or extract in water, ethyl alcohol or hydro alcoholic extract, single or in combination;
- Minerals or vitamins or proteins or metals or their compounds or amino acids (in amounts not exceeding the Recommended Daily Allowance for Indians) or enzymes (within permissible limits);
- Substances from the animal origin;
- A dietary substance for use by human beings to supplement the diet by increasing thetotal dietary intake;

b. A product that is labeled as a "Food for special dietary uses or functional foods or Nutraceuticals or health supplements or similar such foods" which is not represented for use as a conventional food and whereby such products may be formulated in the form of powders, granules, tablets, capsules, liquids, jelly, and other dosage forms but not parenteral, and are meant for oral administration;

- Such product does not include a drug as defined in clause (b) and Ayurvedic, Siddha, and Unani drugs as defined in clauses (a) and (h) of section 3 of the Drugs and Cosmetics Act, 1940 (23 of 1940) and rules made there under does not claim to cure or mitigate any specific disease, disorder, or condition (except for certain health benefit or suchpromotion claims) as may be permitted by the regulations made under FSSA;
- Does not include a narcotic drug or a psychotropic substance as defined in the Schedule of the Narcotic Drugs and Psychotropic Substances Act, 1985 and rules made there under and substances listed in Schedules E and E(I) of the Drugs and Cosmetics Rules, 1945. [6]

Regulatory aspects of Nutraceuticals

The regulatory framework of Nutraceuticals in India needs attention from the relevant authorities.Globally, the regulatory authorities are aware of changing needs of consumers and proactively protect consumers by amending existing laws to accommodate changes but in India old laws such as the Prevention of Food adulteration Act, 1954, which regulates packaged foods, still exist for manufacturers. Besides, they need to abide by many other cumbersome laws such as:

- Standards of Weights and Measures Act, 1976, and the Standards of Weights and Measures(Packaged Commodities) Rules, 1977 (SWMA)
- Infant Milk Substitutes, Feeding bottles and infant foods (regulation of production, Supply, and Distribution) Act, 1992 with Rules, 1993 (IMS)
- Edible Oils Packaging (Regulation) Order,1998
- Fruit Products Order 1955 (FPO)
- Meat Food Products Order 1973 (MFPO)
- Milk and Milk Products Order 1992
- Vegetable Oil Products (Regulation) Order 1998 (VOP)
- Atomic Energy Act, 1962 and Atomic Energy (Control or irradiation of Food) Rules 1996
- Consumer Protection Act 1986 and the Consumer Protection (Amendment) Act, 2002 and Rules 1987
- Environment Protection Act, 1986 and Rules 1986
- Agricultural Produce (Grading and Marking) Act, 1937 (as amended up to 1986)
- General Grading and Marking Rules 1986 and 1988 (AG Mark)
- Bureau of Indian Standards (BIS) Act 1986

Further, there is a lack of clarity in classifying Functional Foods and Nutraceuticals. This confuses the regulators. At times, the drug regulators are tempted to classify these products as drugs. This has resulted in trouble for genuine manufacturers. The revolutionary step to introduce Food Safety and Standards Act will replace the old PFA (Prevention of Food Adulteration Act).

The new act will take India on the path of a new regulatory framework to make it capable of global competition of Nutraceuticals. This legislation was the result of a reform effort that spanned nearly two decades. It brings about a balance in FDA regulations between approving therapeutic products so that they can benefit patients and protecting public health by assuring

that those products are safe and effective.

In 1993, the Ministry of Health and Welfare in Japan established a policy of "Foods for Specified Health Uses" (FOSHU) by which health claims of some selected functional foods arelegally permitted. In 2001, a new regulatory system, 'foods with health claims'(FHC) with a 'Foods with Nutrient Function Claims' (FNFC) system and newly established FOSHU was introduced. Also, the Govt. changed the existing FOSHU, FNFC, and other systems in 2005. Such changes include the new Subsystems of FOSHU such as

- Standardized FOSHU
- Qualified FOSHU
- Disease risk reduction claims for FOSHU[7]

Health benefits of Nutraceuticals

From the consumers' point of view Nutraceuticals offer the following benefits:

- Increase the health value of our diet.
- Helps to live longer.
- Help to avoid particular medical conditions.
- May have a psychological benefit from doing something for oneself.
- May be perceived to be more "natural" than traditional medicine and less likely to produceunpleasant side effects.
- May present food for populations with special needs (e.g., nutrient-dense foods for the elderly).[3]

Regulations of Nutraceuticals in India

Nutraceuticals are known as "Foods for special dietary uses" in India. Food Safety and standards Authority (FSSA), defines "Foods for special dietary uses or Functional foods or Nutraceuticals or health supplements". The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards Act,2006 in India which consolidates various acts and orders that were in existence to handle food related issues in various Ministers and Departments. FSSAI has been created for laying down science-based standards for articles of food to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. Thus, it applies to products like dietary supplements and Nutraceuticals too.

Regulations of Nutraceuticals in United States

USFDA defines Nutraceuticals as dietary supplements and the regulations came in 1994. FDA regulates dietary supplements product and dietary ingredients under a different set of regulations.Under the Dietary Supplement Health and Education Act (DSHEA):

- Manufacturers and distributors of dietary supplements and dietary ingredients are prohibited from marketing products that are adulterated or misbranded. That means that these firms are responsible for evaluating the safety and labeling of their products before marketing to ensure that they meet all the requirements of DSHEA and FDA regulations.
- FDA is responsible for taking action against any adulterated or misbranded dietary supplement product after it reaches the market.[8]

Nutraceuticals in India

The Indian Nutraceuticals market is mainly dominated by pharmaceuticals and FMCG companies with very few companies that only specialize in Nutraceuticals products. Increasing health consciousness and improved incomes and standards of living has boosted the growth of the Nutraceuticals markets in India, making it one of the fastest growing segments.

The Nutraceuticals market in the India is showing a continuous growth trend despite the economic downturn and rising inflation rates. There are several reports which are indicative ofhuge growth potential of Nutraceuticals in India.[9]

Regulatory authority of Nutraceuticals in India: FSSAI

In 2006, parliament passed food safety and security ACT. Then in 2008, FSSAI came into existence. For implementation of FSSAI Act process of prepublication consultation in 2006 has been conducted where various rules and regulation are drafted. So that by end of September 2010 these drafted regulations will be sent for notifications.

a) As framed in the FSSAI act, 2006 various rules and regulations related to Nutraceuticals has been framed.
b) Food obtained from processing of organic production and their standards considering the proprietary and novel food which are not safe but also not mentioned in the act. Are also inducted rather than the Food ingredients composed of or containing obtained through from modern biotechnology the food obtained like, genetically modified or engineered organisms which may also contain the same has also been included in the act.

c) This FSSAI act consists of twenty-one chapters and in that the fourth article that means 22 of the acts says about Nutraceuticals, dietary supplements and various functional foods, and these products can be produced/manufactured, marketed that means sold or distributed that means imported can be done by any of the company. And these products may include Nutraceuticals, dietary supplements, functional food, organic food, unprocessed food, can food, novel foods, and irradiated foods.

d) Packaging and labeling of Nutraceuticals and their claims including restrictions in advertisement about the Nutraceuticals has been addressed in the article 23 and 24.

e) This kind of Nutraceuticals can be permitted by the regulations made under this Act; which do not claim to cure mitigate any specific disease, disorder or condition.

f) Rules which are made under the act that's the substances listed in schedules E and E1 of the D&C Rules,1945; it does not include a narcotic drug or a psychotropic substance as defined in the schedule of the Narcotic Drugs and Psychotropic substances Act, 1985.

g) The FSSAI Authority would also have to come up with the hilarious task of putting in place the various minimum levels of compliance of food laws,

h) Rules and Regulation which are made under the new regime by the Food safety commissioner of each state will be very difficult to control both the claims as well as the quality and their force role should be expedited.

i) Food Ingredients composed of or containing of or containing obtained through from modern biotechnology the food obtained like, genetically modified or engineered organisms which may also contain the same has also been included in the act.

j) "Food for special dietary uses" these kinds of labels are meant for functional food or Nutraceuticals dietary supplements that is not mainly for obtaining as conventional food such products may be formulated in the form:

- Powders
- Granules
- Tablets
- Capsules
- Liquids
- Jelly and Other dosage forms but not Parenteral

k) There may be provisions of various testing and tracing the origin of the food products right back up to farm level are done with the help of drafted guidelines.

- Standardizing the Manufacturing Process, Validation and Intellectual property protection

- It Define the various list of permitted health claims and the required quantity of such ingredients to make the claims.
- Resulting in the formation of a Regulatory Framework and their standards.
- Active involvement of Government and Private Agencies in educating consumers on the benefits of Nutraceuticals.
- The industry is waiting for revised RDA levels to make them applicable for Indian population's current lifestyle.
- Recognize list of nutritional ingredients with proven health benefits.
- Increased collaboration among Indian Manufacturers on R&D.[10]

Claims on Nutraceuticals[9]

Health Claim: "Health claims" means a relationship between a food or a constituent of that food and health. Health claims can further be grouped into:

1. Nutrient content claim
2. Reduction of disease claim
3. Structure/Function claim

Nutrition content claim:

A Nutritional claim suggests a food has beneficial nutritional properties, such as "Low fat", "No added sugar" and "High in fiber". A Claim is a statement that suggests a relationship between food and health. For Instance, a Food can "help lower cholesterol", "help reinforce the body's natural defenses" or "enhance learning ability"

Reduction of disease claim:

Any Claims states or implies that the consumption of dietary supplements or one of its constituents significantly reduce the risk factor in the development of Human disease.

Structure/Function Claim:

Structure Claim is a statement on label of a food or dietary supplement about how that productaffects the human body structure.

Regulatory requirements in India:

1. **Product evolution:** Examination of each active ingredients & additive. Various steps in the Product evaluation include:

- Developing extracts of documents

- Sample collection (in the presence of witnesses)
- Sample dispatch to the concerned authority (Different processes for bulk package and single package)
- Food Analysis
- If analysis is not complete within the stipulated period of Time, further actionplan by the designated officer
- Adjudication proceedings (holding enquiry, appeal procedure, hearing, etc.)

2. **Licenses:** To get product registered in India, Number of Licenses (almost 4-5) might be required which include:

- Import licensing
- Manufacturing Licensing
- Marketing Licensing and
- Other state and National level clearances/licenses required from the regulatoryside, which need to be taken care of before launching these products in India.

3. **Health and Label claims:** "Health claims" means by representation that states, suggests or implies that a relationship exists between a food or a constituent of that food and Health. This includes:

- India specific labeling and packaging requirements
- Packaging of the consignment composition of the consignment and approach tomarket the same
- Need for sample material and declaration for registration
- Label content and claim
- Structure- function claim[8]

Registration process in India:[11]

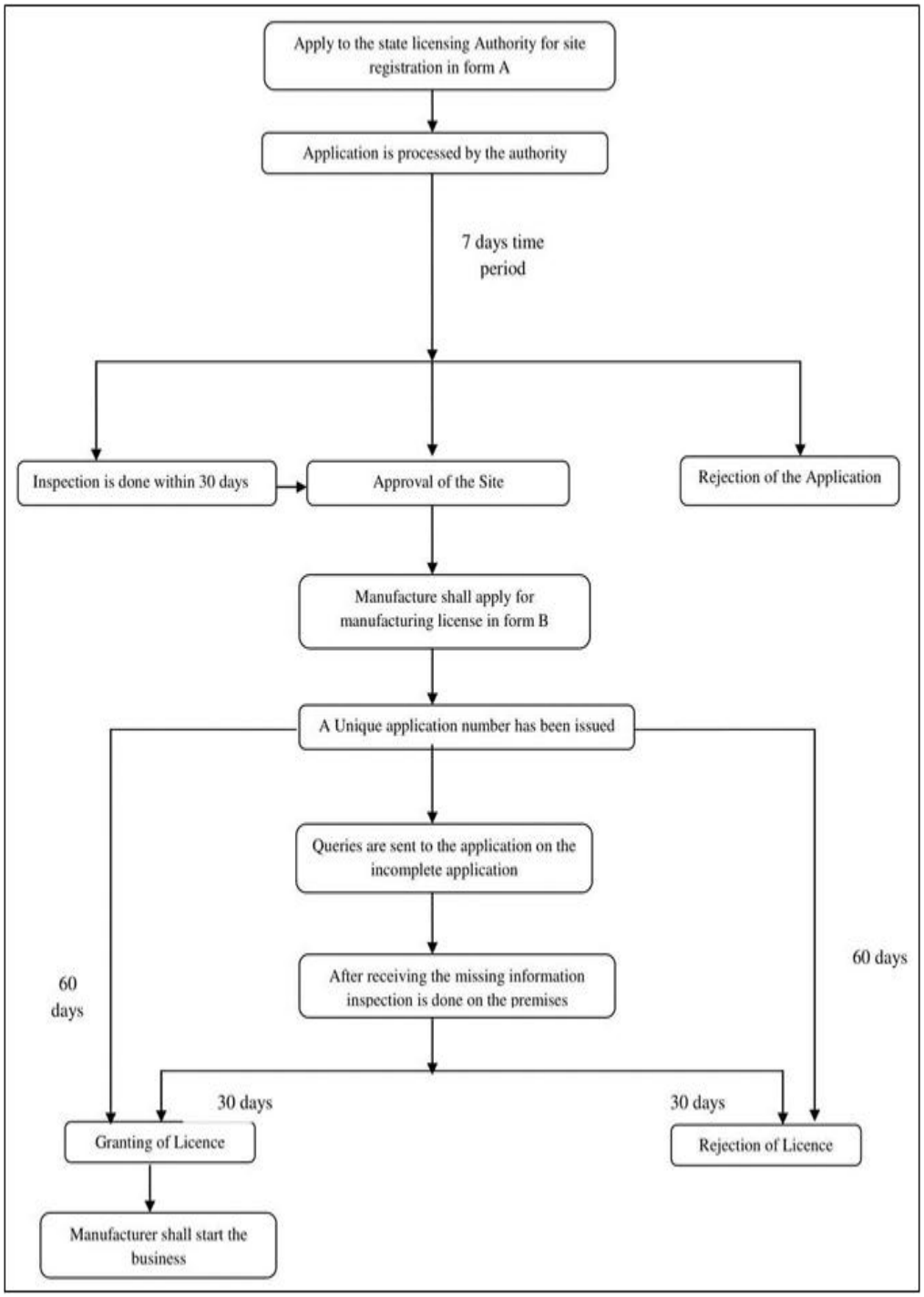

Fig. 1: Registration process in India.

Regulatory authorities in United States: USFDA

USFDA defines Nutraceuticals as dietary supplements and the regulations came in 1994. FDA regulates dietary supplements product and dietary ingredients under a different set of regulations.Under the Dietary supplement Health and Education Act (DSGEA):

- Manufacturers and distributors of dietary supplements and dietary ingredients are

prohibited from marketing products that are adulterated or misbranded. That means that these firms are responsible for evaluating the safety and labeling of their products before marketing to ensure that they meet all the requirements of DSHEA and FDA regulations.

- FDA is responsible for taking action against any adulterated or misbranded dietary supplement product after it reaches the market.[8]

The safety of the dietary supplements has been taking care by the USFDA but their approval byUSFDA is not required.

- Before producing or selling their products. Dietary supplement manufacturers do notneed to register with FDA, or obtain FDA approval
- Prior to marketing a product, manufacturers are responsible for ensuring that a dietary supplement (or a new ingredient) is safe before it is marketed. FDA has the authority to take action against unsafe dietary supplement products.
- Manufactures must ensure that their product label information is truthful and not misleading.[10]

Health claims in USA: Health claims can be of Three types:

a) Health Claims
b) Nutrient Content Claims
c) Structure/function Claim

a) Health claims:

Health Claims, was authorized under the NLEA of 1990. Health claims describe a relation between a food, food component, or dietary supplement ingredient and reducing risk of a disease or health-related condition.

Health claims can further be grouped into:

i. SSA Claims (Significant scientific agreement):

These claims can be used for conventional foods and dietary supplements. The significant scientific Agreement (SSA) standard is used to determine that the nutrient/disease relationship is well-established.

ii. FDAMA (FDA modernization act):

These claims can be used only for conventional foods and cannot be used on dietary supplements. FDA authorizes the use of an FDAMA claim as aresult of the notification from a stakeholder.

iii. Qualified health claims:

These claims can be used for conventional foods and dietary supplements. Any interested party may petition FDA to issue aregulation regarding a health Claim under 21 CFR 101.70. FDA evaluates the petition according to the SSA Standard.

b) Nutrient Content Claims: Such claims are about the content of certain nutrients or substances in a food, such as low in fat or good source of calcium and are used to described the percentage of a nutrient in a product relative to the daily value.

c) Structure/Function Claims: This claim was authorized under the dietary supplement Health and Education Act of 1994. Such claims relate to a positive contribution to health or to the improvement of a function or to modifying or preserving health.[8]

Registration process in USA:[8]

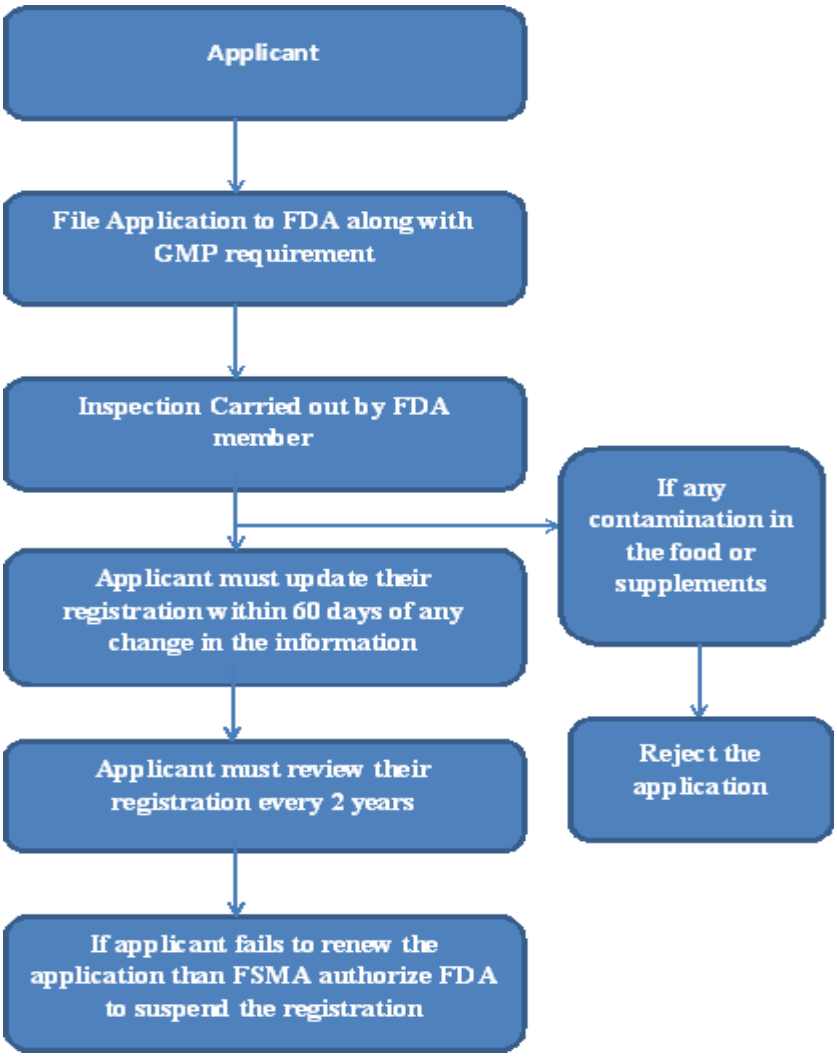

Fig. 2: Registration Process in USA.

Regulatory Process for the Clearance in USA: (8)

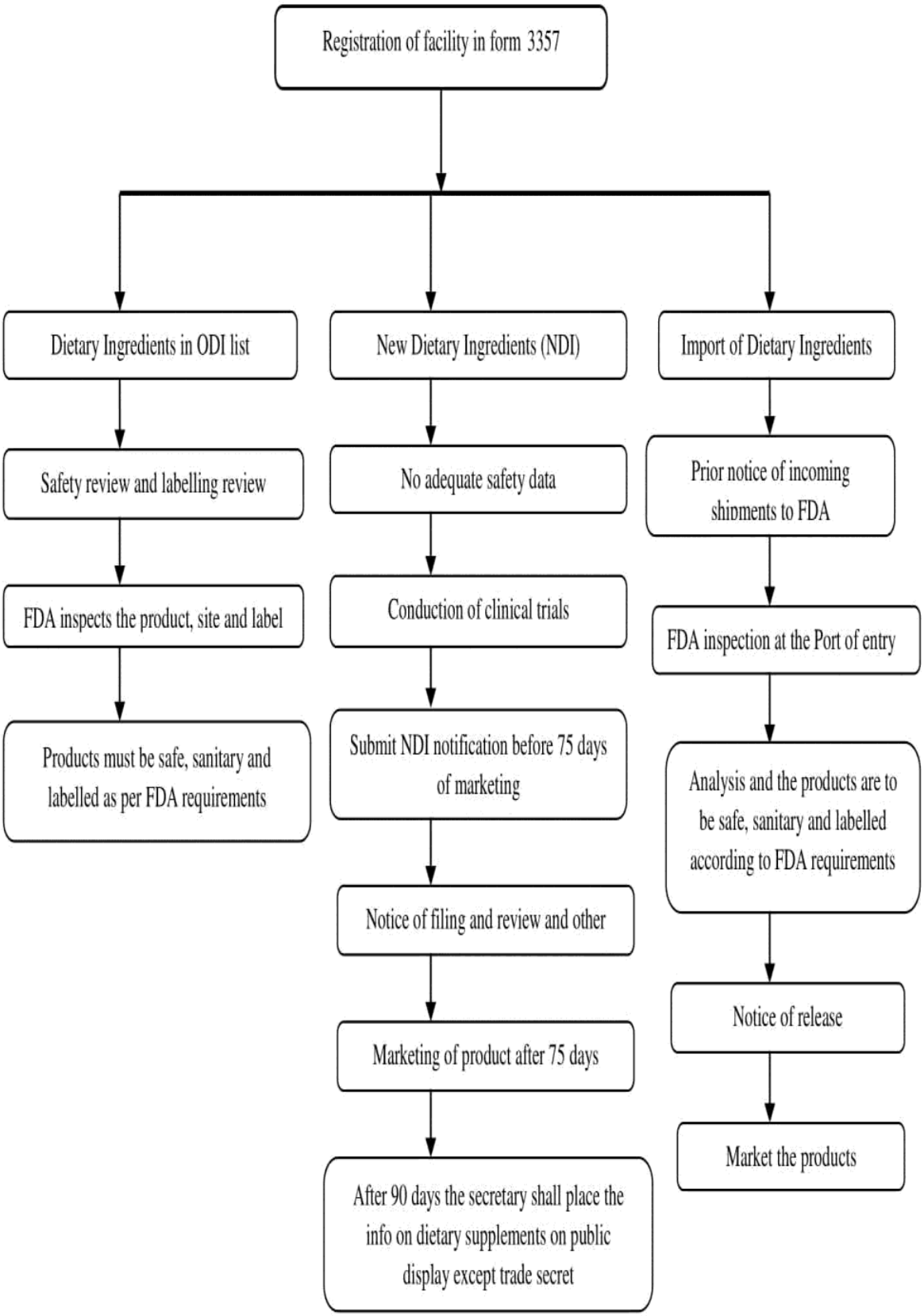

Fig. 3: Regulatory process for the clearance.

Comparison of Regulatory Guidelines of USA and INDIA:[8]

	USA	India
Regulation for licensing andregistration	By United States Food, and Drug Administration (USFDA)	By Food Safety and StandardAuthority of India (FSSAI)
Definition	USFDA defines Nutraceuticals as "DietarySupplements" Under DSHEA	FSSAI defines Nutraceuticals as"Foods for special dietary uses".
Act/Regulatory authority forregistration of Nutraceuticals	Dietary Safety and Health Education Act	Food Safety and Standard Authority of India
Regulations w.e.f	1994	2011
Regulatory requirements for registration	Product licensing, evidence requirements forsafety & efficacy, labeling, health claims, GMP, adverse reactionreporting and clinical trails	Product evaluations, licenses,health and label claims
Form for registration	Form 3537	Form A, B. and C

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