GFORSS | GLOBAL FOOD REGULATORY SCIENCE SOCIETY

AFIRS
ASIA FOOD INNOVATION-READY REGULATORY SYSTEMS INITIATIVE

PILOT ASSESSMENT UNDER THE ASIA INNOVATION-READY FOOD REGULATORY SYSTEMS INITIATIVE

GABA as a Functional Food Ingredient

Regulatory Status, Safety Assessment, Health-Function Claims and Knowledge Gaps

Purpose of this pilot

To use GABA **as a regulatory-science case study** to consolidate what is known about the ingredient, its food uses, safety assessment and health-function claims across selected jurisdictions, and to identify **where regulatory conclusions diverge despite a substantial scientific knowledge base**. Particular attention is given to Japan, where GABA is widely used under the Foods with Function Claims framework, and to the contrasting experience of other jurisdictions. The objective is to **distinguish what is established from what remains uncertain**, identify the evidence and regulatory gaps that matter for market acceptability, and use the case to inform discussion at the Second Meeting of the Asia Food Innovation Ready Regulatory Systems Initiative, to be held in September 2026 in Zhangzhou, China, aiming for **more predictable requirements for safety assessment, claims substantiation and regulatory reliance.**

September 2026

Working report for scientific and regulatory discussion

Convened by GFoRSS, in collaboration with

Shanghai JS life Sciences Institute | FIRN Food Innovation & Regulation Network | ILSI SOUTHEAST ASIA REGION | Damin 大闽国际 | 香港食品科技與合成生物學會 Hong Kong Society of Food Technology and Synthetic Biology

Contents

Executive Summary

Gamma-aminobutyric acid (GABA) is a non-protein amino acid that occurs naturally in living organisms and food matrices and is a **central inhibitory neurotransmitter** in mammals. Its biology is well studied, and GABA is widely marketed in dietary supplements and natural health products. Yet its position as an added functional food ingredient remains uneven across jurisdictions. This makes GABA a useful regulatory case study: it is **not an unfamiliar chemical**, but familiarity with the molecule **has not translated into a common regulatory conclusion for food use**.

The available information points to three separate questions:

- First, is GABA acceptable as an added food ingredient under the relevant food category and conditions of use?
- Second, what safety evidence is sufficient at the proposed exposure, taking account of manufacturing, vulnerable populations and possible pharmacological or endocrine effects?
- Third, what evidence is needed to support a specific health-function claim?

Across the jurisdictions reviewed, these questions are handled **through markedly different regulatory pathways**.

Japan provides the most developed food-market example. As of 31 May 2026, more than **1,400 notifications of GABA-containing products were listed in the Consumer Affairs Agency** portal under the Foods with Function Claims (FFC) system. The FFC framework sits within Japan's broader category of Foods with Health Claims, alongside **Foods for Specified Health Uses (FOSHU)** and Foods with Nutrient Function Claims. FFC products are notified rather than pre-approved, and the food business operator assumes responsibility for the scientific basis of both safety and function claims. This combination of a large market, public notification dossiers and an explicit claims pathway makes **Japan particularly instructive for this pilot**.

The United States provides a useful contrast. Two GABA GRAS notices submitted by the same company were withdrawn after FDA questions. The issues raised included proposed use levels, cumulative exposure, the need for more robust hazard-related information, possible central nervous system and endocrine effects, uncertainties for pregnant or lactating women and young children, and **potential interactions with antihypertensive medication**. The US experience therefore illustrates that **endogenous occurrence and dietary presence do not by themselves resolve safety** at materially higher intended exposures.

The current knowledge base is substantial but incomplete. Important gaps remain around oral absorption and disposition, effects in susceptible populations, the relevance of peripheral and gastrointestinal mechanisms, **cumulative exposure from foods and supplements**, interaction potential, the adequacy of the toxicology package at intended use levels, and **the reproducibility and regulatory quality of evidence supporting individual claims**.

The purpose of this report is therefore to organize the available knowledge and the unresolved questions so that the Second Working Meeting of the Asia Food Innovation Ready Regulatory Systems Initiative, held in Zhangzhou, China, in September 2026, can move **from description of jurisdictional differences** toward a **common understanding of what evidence should be expected for safety assessment and claims substantiation**.

The planned discussion may also review the situation where rice is identified as a potential applied pathway for the pilot, distinguishing naturally GABA-containing or process-enriched rice from rice fortified with added GABA; this distinction provides a practical test of when conventional-food history can be relied upon and when additional ingredient, exposure, labelling or claims assessment may be needed.

1. Introduction and Purpose of the Pilot

The April 2026 Regional Think Tank on Innovation-Ready Food Regulatory Systems in Asia identified GABA and Goji berry-derived ingredients as the first practical pilot cases for testing approaches to collaborative assessment, regulatory guidance and information sharing. The Second Working Meeting planned in Zhangzhou, China, in September 2026 is intended to move that work from scoping to substantive review: to determine what is already documented, where evidence is missing, and which elements can be generalized into common regulatory requirements for innovative functional ingredients and associated non-nutrient claims.

GABA complements the Goji pilot in an important way. Goji examines how a traditionally consumed botanical source changes as extraction and purification move the ingredient away from its conventional food form. GABA presents a different regulatory situation. The molecule **is naturally present in foods** and **in the human body**, its physiological role is well known, and it has extensive supplement and research use. Nevertheless, industrially manufactured **GABA added to foods can create exposures**, **manufacturing considerations** and **intended physiological effects that differ from background dietary exposure**. The regulatory question is therefore not simply whether GABA is 'known', but whether the evidence supporting a particular food use is sufficient for the proposed conditions of use and associated claim.

> **Core regulatory question**
>
> **How should regulators assess a biologically familiar ingredient when the proposed food use, exposure, manufacturing route and claimed physiological effects extend beyond ordinary dietary occurrence?**

2. GABA: Ingredient Profile and Regulatory Starting Point

GABA (gamma-aminobutyric acid; 4-aminobutyric acid) is a non-protein amino acid and the principal **inhibitory neurotransmitter in the mammalian central nervous system**. It is **naturally present** in many living organisms and food matrices. Scientific and consumer literature reports functional effects following oral intake, including effects related to blood pressure, stress and relaxation. At the same time, oral GABA appears to have limited capacity to cross the blood-brain barrier, leaving uncertainty around the mechanisms responsible for some claimed effects. Peripheral or enteric pathways have been proposed, but the available material indicates that further research is needed.

For food-regulatory purposes, this creates an unusual combination of **familiarity and uncertainty**. GABA is endogenous and occurs naturally in foods, but added GABA may be produced through fermentation or other industrial processes and used at levels that exceed baseline dietary exposure. Its known involvement in neural and endocrine physiology also means that vulnerable populations and interaction potential cannot be dismissed solely on the basis of natural occurrence.

The regulatory starting point therefore differs from a conventional novel chemical. The key questions concern the identity and purity of the added ingredient, the safety of the manufacturing process, **the relationship between intended use and background exposure,** potential systemic or local biological effects, and whether evidence generated with one source or product is transferable to another.

Emerging application proposed for further study — GABA-containing or GABA-fortified rice

Professor Anton Rahmadi proposed that the pilot also consider rice itself as a practical application pathway: either rice varieties or processed rice products with naturally higher GABA concentrations, or rice intentionally fortified/enriched with GABA. This proposal is scientifically relevant because GABA occurrence varies across rice tissues, cultivars and processing conditions, and germination or fermentation can materially alter final concentrations. From a regulatory perspective, however, naturally **GABA-containing rice and rice fortified with an added GABA ingredient** should not automatically be treated as the same evidence object. The assessment would need to distinguish endogenous occurrence from deliberate addition or process-driven enrichment and document cultivar and product identity, manufacturing route, final GABA concentration and serving exposure, stability and retention through storage/cooking, and the basis for any associated function claim. The proposal therefore offers a useful extension of the pilot for testing when conventional-food history remains sufficient and when enrichment or fortification triggers additional ingredient, safety, labelling or claims requirements.

3. Cross-Jurisdictional Regulatory Landscape

Jurisdiction	Ingredient / market status	Claim position	Regulatory significance
United States	Food use may be pursued through GRAS; **two GABA notices were withdrawn after FDA questions.**	No GABA-specific FDA health claim identified; conventional-food structure/function claims are not pre-notified in the same way as health claims.	Unresolved safety questions at intended exposure.
Japan	Extensive food use under the FFC framework; GABA also has prior evaluation experience through FOSHU and drug applications.	Large number of notified claims across blood pressure, stress, fatigue, sleep, skin, cognition and muscle mass.	Most developed food-market and public-dossier precedent.
Thailand	GABA can be used in conventional foods; safety appears to be handled case by case and manufacturer responsibility remains central.	GABA **is not on the positive list of standardized claims**; a new claim requires scientific submission to Thai FDA.	Framework is evolving toward more innovation-ready approaches.
Malaysia	Added GABA falls into the Food-Drug Interphase negative list and is directed toward pharmaceutical oversight; GABA is also listed as a prohibited active ingredient in drug registration guidance.	No clear food-claim pathway identified in the reviewed material.	Market status is restrictive/uncertain for added GABA.
Singapore	Public records reviewed do not establish a clear food-ingredient pathway for added GABA.	GABA is not on positive lists for function claims; therapeutic and disease-related claims are prohibited for foods.	Ingredient and claim status remain insufficiently defined in the reviewed material.

Working observation

The same molecule is associated with a mature functional-food market in Japan, unresolved GRAS questions in the United States, conventional-food use without standardized GABA claims in Thailand, and uncertain or restrictive positioning in Malaysia and Singapore. This divergence is precisely what makes GABA useful for the regional pilot.

PART I — SAFETY ASSESSMENT AND REGULATORY STATUS

4. A Common Safety-Assessment Lens for GABA

The starting GABA review proposes a general safety-assessment structure that is useful beyond this ingredient. It begins with **identity, characterization and manufacturing**, then considers history of consumption, toxicological evidence, producing-organism hazards where fermentation is used, process safety, allergenicity and drug interactions. Hazard characterization is followed by exposure assessment and risk characterization. For GABA, several of these domains are particularly important because the ingredient is both biologically active and naturally present in the diet.

Assessment domain	What the dossier should address	GABA-specific question
Identity and specifications	Chemical identity, purity, non-GABA fraction, impurities, stability and lot conformity.	Can different commercial GABA preparations be treated as equivalent?
Manufacturing	Fermentation strain, process controls, residual microbial material, biogenic amines, ethyl carbamate/citrulline and processing aids.	Does the production route introduce hazards not relevant to endogenous or food-borne GABA?
History of exposure	Background dietary intake, fortified/fermented foods, supplements and prior food use.	How should background and added exposure be combined?
Systemic effects	Neural, endocrine, blood-pressure and hormonal effects; ADME and blood-brain barrier considerations.	Are effects different in pregnant/lactating women, children or medicated populations?
Toxicology	Repeated-dose studies, genotoxicity where relevant, reproductive/developmental and neurotoxicity considerations.	Is the available package adequate for the proposed exposure and duration?
Interactions	Antihypertensive, antiepileptic and other potentially relevant interactions.	When are warnings or use restrictions needed?

5. United States: GRAS Experience and the Significance of the Withdrawn Notices

The US record is informative because two GABA GRAS notices - GRN 257 (2008) and GRN 595 (2015) - were submitted by the same company and subsequently withdrawn after FDA questions. The dossiers characterized a fermentation-derived GABA ingredient and included literature on background dietary occurrence, animal studies and human

studies. The 2015 submission narrowed some intended uses, excluded infant and children's foods, expanded exposure estimates and supplied additional information on process-related contaminants.

The FDA questions nevertheless reveal the regulatory issues that remained unresolved. Concerns included **whether cumulative exposure from intended food uses** plus background sources had been adequately characterized, whether the **safety evidence covered the proposed exposure levels**, and whether susceptible populations had been sufficiently addressed. FDA also requested **more information relevant to pregnancy**, lactation and young children; the possibility of gastrointestinal or systemic biological effects; potential interactions with blood-pressure medication; and the relationship between oral GABA and central or endocrine physiology. Questions were also raised about manufacturing controls and the absence of certain process-related hazards.

Knowledge area	Current picture	Regulatory need
Oral disposition and mechanism	Limited human ADME information for orally administered GABA; limited blood-brain barrier passage is generally described, but peripheral and enteric mechanisms remain relevant.	Clarify absorption, distribution, metabolism and local gastrointestinal effects at food-use doses.
Vulnerable populations	US FDA questions highlighted pregnant/lactating women and young children.	Determine whether separate evidence, exclusions or warnings are needed.
Cumulative exposure	Background food exposure, added foods and supplements may all contribute.	Develop a transparent cumulative-exposure approach, including high consumers.
Manufacturing-related hazards	Fermentation may raise questions about biogenic amines, citrulline/ethyl carbamate, residual organisms and media components.	Define minimum process and impurity specifications.
Interaction potential	Antihypertensive and antiepileptic interactions are addressed in some Japanese notifications.	Agree when literature evidence is sufficient and when warnings are needed.
Toxicological thresholds	The reviewed material does not provide a broadly accepted food-safety threshold applicable across proposed uses.	Determine what repeated-dose, developmental, neuro/endocrine or other studies are needed for higher exposures.

The US experience is therefore important because it shows the **limits of a simple 'natural occurrence' argument**. The regulatory task is to bridge from **natural presence and endogenous biology to the safety of a defined manufactured ingredient** at a defined exposure in the populations likely to consume it.

At the time of the submission of this report, **there is indication that a new GRAS notification dossier is under preparation by manufacturing proponents and that these dossiers address the questions raised above.**

> **Lesson from the US experience**
>
> **A familiar endogenous substance may still require a robust food-ingredient assessment when intended use materially increases exposure or when physiological activity creates unresolved questions for susceptible populations.**

6. Japan: Safety Assessment within the Foods with Function Claims System

Japan is the central **regulatory comparator for this pilot** because **GABA has achieved broad market use under the Foods with Function Claims (FFC) framework**. FFC is one category within Japan's wider Foods with Health Claims system, together **with Foods for Specified Health Uses (FOSHU)** and **Foods with Nutrient Function Claims**. Unlike FOSHU, FFC products **are not individually pre-approved** for efficacy by the Consumer Affairs Agency (CAA). Instead, the food business operator submits a notification before marketing and assumes responsibility for the scientific basis of safety and the claimed function.

As of 31 May 2026, the reviewed information identified more than **1,400 GABA-containing FFC notifications**:

- 722 processed foods other than tablets/capsules,
- 629 processed foods in tablets or capsules, and
- 101 fresh foods.

Among processed foods other than tablets/capsules and fresh foods, **270 products** were identified as currently available for sale. This scale makes Japan the most developed food-use precedent among the jurisdictions reviewed.

Safety substantiation under FFC may rely on **a documented history of human consumption**, secondary safety information from databases and literature, or safety tests on the finished product or functional substance. In practice, the approach varies by food type. Fresh produce such as **GABA tomatoes** may rely heavily on ordinary consumption history, often supplemented by literature. Processed foods without an established history of use may rely more strongly on published human safety data for GABA as an ingredient. Existing evaluations from FOSHU products and drug applications have also been referenced in FFC safety dossiers.

The reviewed Japanese dossiers also demonstrate **a pragmatic approach to ingredient transferability**. For GABA, manufacturers have sometimes justified reliance on studies using **GABA rather than the exact finished product on the basis that GABA is a simple amino acid whose intrinsic properties do not vary by source.** This is a useful precedent for discussion, but it raises a broader question for regional guidance:

What minimum characterization is necessary before safety evidence can legitimately be bridged across manufacturing routes or products?

Drug and functional-substance interactions are expected to be considered. Literature reviews can lead to precautionary labeling, particularly for antihypertensive or antiepileptic medication. This feature is important because it shows that a notification pathway **does not eliminate the need to identify susceptible populations** or manage known or plausible interaction risks.

> **Japan as a special regulatory case**
>
> **Japan combines wide food-market experience, a dedicated health-claim notification pathway, public access to dossiers, prior FOSHU and medicinal safety experience, and product-specific responsibility placed on the notifier. The system therefore offers both a large evidence base and a distinct regulatory philosophy that should be understood before elements are generalized to other jurisdictions.**

7. Thailand, Malaysia and Singapore: Different Regulatory Starting Points

7.1 Thailand

Thailand permits GABA **as an ingredient in conventional foods,** but the market presence identified in the reviewed material is limited and the products observed did not carry GABA health claims. The health-claims framework is in transition. A model inspired by Japan's FFC system has been proposed, while current rules rely on approved claims and regulatory assessment rather than a notification pathway. GABA is not on the positive list for a standardized function claim, so a company seeking a new GABA claim would need to submit a substantial scientific package for Thai FDA evaluation.

7.2 Malaysia

Malaysia presents a markedly different position. **Added GABA is listed in the Food-Drug Interphase negative list,** directing it toward oversight by the National Pharmaceutical Regulatory Agency rather than the food authority. The reviewed material also reports **GABA as a prohibited active ingredient** in drug registration guidance, and no registered products containing GABA as an active ingredient were identified through the cited portal. The result is an uncertain and effectively restrictive market position for added GABA in foods, while naturally occurring GABA may still be considered case by case.

7.3 Singapore

For Singapore, the reviewed public information does not establish a definitive regulatory status for added GABA as a food ingredient. GABA **is not listed among approved novel food ingredients**, but this fact alone does not establish that it has been affirmatively determined to be non-novel. GABA is also **not included in the positive lists for permitted function claims identified in** the source review. The appropriate conclusion from the available material is therefore that both the ingredient pathway and the claim pathway require clarification rather than inference.

8. Cross-Jurisdictional Safety Synthesis and Knowledge Gaps

Across the reviewed jurisdictions, the principal safety issue is not the existence of basic biological knowledge about GABA. It is the regulatory translation of that knowledge to a manufactured food ingredient used at defined concentrations, potentially across broad consumer populations. The Japanese market demonstrates that **GABA can be incorporated into many food formats** under a structured notification framework. The US record shows that the same body of background knowledge may still be insufficient when exposure, manufacturing and susceptible-population questions are not fully resolved to the regulator's satisfaction.

PART II — HEALTH-FUNCTION CLAIMS

9. Claims as a Distinct Regulatory Question

A successful safety assessment does not establish that a health-function claim is substantiated. GABA is particularly useful for illustrating this distinction because its proposed benefits - **such as lowering blood pressure, reducing temporary stress or fatigue, improving sleep or supporting cognition** - can involve physiological endpoints that are difficult to measure consistently and may be influenced by the food matrix, dose, background diet and co-ingredients. Some claimed effects also resemble pharmacological outcomes, increasing the importance of defining the boundary between a food-function claim and a therapeutic claim.

The mechanism of action remains an additional challenge. Because orally administered GABA appears to have **limited blood-brain barrier penetration**, a direct central mechanism does not readily explain all reported stress, sleep or mood effects. Mechanistic uncertainty does not necessarily preclude a claim if a reproducible beneficial physiological effect is demonstrated in humans, but it affects biological plausibility, interpretation and the transferability of findings across products and populations.

10. Japan: The Most Developed Food-Claim Experience for GABA

Japan's FFC system provides the richest current example of GABA food-function claims. Among 270 processed and fresh GABA-containing products identified as available for sale in May 2026, the most frequent claims concerned blood pressure, temporary stress, temporary fatigue and sleep quality. Smaller numbers addressed skin health, memory and cognitive function, maintenance of muscle mass and temporarily low mood.

Claim area	Products	Share of 270 products
Lowers blood pressure in individuals with high blood pressure	158	59%
Reduces temporary stress	107	40%
Reduces temporary fatigue	82	30%
Improves sleep quality	73	27%
Supports skin health	35	13%
Supports memory and cognitive function	21	8%
Maintains muscle mass	10	4%
Improves a temporarily low mood	1	0.4%

Effectiveness under FFC can be substantiated through clinical trials or systematic literature reviews. The permitted wording differs depending on the evidentiary route:

- **a product supported directly by clinical trials may state that it 'has a function to' achieve the relevant effect**,
- whereas **a claim based on a systematic review** is framed as **the product having been 'reported to have a function to' achieve that effect.**

Most FFC dossiers reportedly rely on systematic reviews.

The framework requires evaluation **of study quality and certainty for effectiveness reviews**, including risk of bias, indirectness, imprecision and publication or conflict-of-interest concerns. However, the source review notes published critiques of the quality of systematic reviews used in some FFC notifications. This is important for regional discussion: the existence of **a formal evidence route does not itself guarantee equivalent evidence quality across dossiers.**

> **Key discussion point for the Second Working Meeting**
>
> **Japan demonstrates that a notification model can support broad market access to functional foods, but regional guidance would still need to define the minimum quality of evidence required if other authorities are expected to rely on or recognize those assessments.**

11. Claims Position in the United States, Thailand, Malaysia and Singapore

11.1 United States

The United States distinguishes FDA-defined health claims from structure/function claims. No GABA food carrying an FDA-authorized health claim was identified in the reviewed material. Structure/function claims for conventional foods are not subject to the same pre-market notification process. **GABA-containing teas or specialty products may therefore appear with general structure/function-type wording**, but this should not be interpreted as FDA evaluation or authorization of a GABA-specific health benefit.

11.2 Thailand

Thailand permits **only approved health claims under specified conditions**, and GABA is not included in the positive list for a standardized claim. A new GABA claim would therefore require scientific evaluation by Thai FDA. The reviewed requirements emphasize randomized controlled trials together with a broader body of evidence, which may include systematic reviews, meta-analyses, recognized technical recommendations, peer-reviewed research and other supporting studies. Unlike Japan's current FFC framework, Thailand does not yet operate a notification route accepting literature review alone as the basis for a new claim.

11.3 Malaysia and Singapore

For **Malaysia, the uncertain status of added GABA as an ingredient effectively precedes the claim question**; no clear food-claim pathway for added GABA is established in the reviewed material. In Singapore, GABA **was not identified on positive lists for permitted function claims**, and therapeutic or disease-related claims are prohibited for foods. In both cases, the available material supports a conclusion of regulatory uncertainty rather than an affirmative claim pathway.

12. What the Current Claims Evidence Does — and Does Not — Establish

The Japanese market demonstrates **that a substantial body of evidence has been judged sufficient** by individual notifiers to support multiple GABA functions under the FFC framework. It also provides **a large real-world set of notified products, exposure levels, labeling conditions and safety precautions**. That experience is highly relevant to regional learning. It should not, however, be equated automatically with an independently pre-approved regulatory conclusion, because FFC relies on notifier responsibility rather than product-by-product government authorization of efficacy.

For regional reliance, **the more useful question is therefore whether the underlying evidence packages can be reviewed against common criteria**. Those criteria would need to address the **definition of the claimed effect, relevance and validation of endpoints, study population, dose, duration, matrix and co-ingredients, statistical robustness, consistency across studies, material comparability, and the totality and certainty of evidence**.

The quality of systematic reviews used to aggregate the evidence would also need to be considered explicitly.

PART III — FROM KNOWLEDGE TO REGULATORY GUIDANCE

13. Key Knowledge Gaps

Gap	Question for regulatory guidance
Ingredient identity / equivalence	Can safety and efficacy studies on one GABA source be bridged to another manufacturing route or finished food?
ADME and mode of action	What is the systemic exposure after oral intake, and what peripheral, enteric, endocrine or central pathways explain observed effects?
Exposure	What is total exposure from background diet, fortified foods, supplements and multiple GABA products, including high consumers?
Susceptible populations	What evidence is needed for children, pregnancy, lactation, hypotensive individuals and users of relevant medications?
Toxicology	Which studies are proportionate at intended food-use levels, and when are neuro/endocrine or reproductive/developmental endpoints necessary?
Claims	Which human endpoints and study designs are sufficient for blood pressure, stress, fatigue, sleep, cognition and other functions?
Evidence quality	What minimum standards should apply to systematic reviews and literature-based substantiation if assessments are to be relied upon across jurisdictions?
Post-market experience	How can Japan's large FFC market and adverse-event monitoring experience be used as supportive evidence without substituting for a pre-market assessment?

14. Lessons from GABA for Innovation-Ready Regulatory Systems

GABA suggests that novelty and acceptability should not be reduced to whether an ingredient is naturally occurring or already familiar to science. **A proportionate assessment should instead consider the proposed ingredient** form, manufacturing route, purity, exposure, target population and intended physiological effect. A familiar substance may require additional evidence when the proposed use meaningfully changes exposure or when biological activity raises plausible safety concerns.

The case also illustrates the value of separating ingredient acceptability from claim substantiation. Japan's FFC system treats safety and function within a single notification package but still requires distinct evidence for each. The US experience shows that **a safety pathway can remain unresolved even where supplement use and scientific literature are extensive.** Thailand demonstrates another model in which claim authorization is more explicitly tied to regulatory review. These differences create an opportunity to identify common scientific requirements even if the legal pathways remain different.

Finally, GABA demonstrates the potential value **of regulatory reliance.** Japan has generated a large public body of notification dossiers and market experience. **If these experiences are organized into a common assessment template, Asian regulators could focus their work on the points of genuine uncertainty rather than repeatedly reconstructing the entire evidence base.**

15. Questions for the Zhangzhou Working Discussion

- How should background dietary exposure, fortified-food intake and supplement use be combined in exposure assessment?
- What is the minimum safety package for GABA at food-use levels, and when should additional neurotoxicity, endocrine or reproductive/developmental information be requested?
- Which vulnerable populations require dedicated evidence, exclusions or precautionary labeling?
- Which elements of Japan's FFC experience can be relied upon directly, and which require independent re-evaluation because FFC is a notifier-responsibility system rather than product-by-product pre-approval?
- For each **proposed function**, what evidence standard should apply to study design, endpoints, dose, population, matrix, systematic review quality and totality of evidence?
- Can **the pilot yield a common dossier template** that separates established facts, jurisdiction-specific decisions, unresolved scientific questions and information still required for regulatory acceptance?

16. Proposed Outputs from the GABA Pilot

For the Zhangzhou meeting, the GABA pilot should be treated as **a working regulatory assessment** rather than a literature summary. The immediate objective is to agree on **what is established, what remains uncertain** and what additional information would be needed before participating regulators could rely on the assessment for their own decisions.

- A consolidated GABA regulatory-status map distinguishing ingredient acceptability from health-claim pathways.
- A common safety-assessment checklist covering identity, manufacturing, exposure, toxicology, vulnerable populations and interactions.
- A claims-substantiation checklist applicable to non-nutrient health-function claims, with explicit standards for human evidence and systematic reviews.
- An agreed list of knowledge gaps and data priorities, including issues that may be addressed through information exchange with Japan and the United States.
- **A structured pilot assessment that can be updated and potentially used by regulators as supporting information when considering GABA under national frameworks.**
- Generalizable lessons to be combined with the Goji pilot in the development of regional guidance on novelty triggers, safety assessment and claims substantiation.

17. Reference Documents Reviewed

- Overview on the Assessment and Use of GABA as a Food Ingredient in Selected Jurisdictions. Working background paper, 2026.
- GABA Supplementary Table: comparison of selected US GRAS notifications, FDA questions and Japanese Foods with Function Claims notifications, 2026.
- Consumer Affairs Agency (Japan), Foods with Function Claims notification framework and public notification information, as summarized in the working background paper.
- US Food and Drug Administration GRAS notices and related correspondence for GABA (GRN 257 and GRN 595), as summarized in the working background paper and supplementary table.
- Relevant Thai FDA, Malaysian NPRA and Singapore SFA/HPB regulatory sources cited in the working background paper.

APPENDIX 1

Japan FFC Claims Snapshot

Processed and fresh GABA-containing foods identified as available for sale in Japan — May 2026

Snapshot of claims associated with processed and fresh GABA-containing foods identified as available for sale in Japan as of May 2026. The figures below are reproduced from the working GABA review and are intended to characterize the breadth of the FFC market rather than to represent independent pre-approval of the claims by CAA.

Claim	Number of food products	Share
Lowers blood pressure in individuals with high blood pressure	158	59%
Reduces temporary stress	107	40%
Reduces temporary fatigue	82	30%
Improves sleep quality	73	27%
Supports skin health	35	13%
Supports memory and cognitive function	21	8%
Maintains muscle mass	10	4%
Improves a temporarily low mood	1	0.4%

The broader Japanese dataset reviewed for the pilot included more than 1,400 GABA-containing FFC notifications, comprising processed foods, tablets/capsules and fresh foods. **Fresh foods were reported to provide approximately 6.2-57 mg GABA/day,** while processed foods spanned approximately **10-200 mg/day** in the reviewed market snapshot.

APPENDIX 2

Comparative Evidence from Selected US and Japan Dossiers

Reorganized from the GABA supplementary comparison table prepared for the pilot

The supplementary spreadsheet compared US GRAS notifications for GABA with Japanese FFC notifications and, for context, selected L-theanine GRAS dossiers. The table below reorganizes the most decision-relevant elements for the pilot. It is not intended to reproduce every field from the source spreadsheet.

Assessment element	United States GABA experience	Japan FFC experience	Pilot implication
Ingredient characterization	US GABA notices described fermentation-derived GABA (>80%) with remaining amino acids, carbohydrates, lipids, ash/moisture and process-related characterization. FDA requested stronger characterization/justification in some areas.	Japanese FFC examples identified GABA as the functional substance; finished-product ingredient characterization was less detailed in the summarized dossiers.	Regional reliance requires clear minimum specifications even when the molecule itself is simple.
History of consumption	Natural food occurrence and estimated background intakes were cited, together with supplement and Japanese food use. FDA requested stronger cumulative exposure context.	Fresh-food dossiers may rely strongly on conventional consumption history; new processed products often rely on GABA literature rather than finished-product history.	History of use is relevant but its weight depends on comparability of exposure and product form.
Human safety evidence	Published studies up to 120-250 mg/day over weeks and short acute higher-dose studies were cited; FDA questioned adequacy for proposed population-wide exposure.	Japanese FFC dossiers commonly cite human oral studies, including prior FOSHU experience and higher-dose studies, with no reported safety concerns in the summarized evidence.	Need agreed standards for study detail, duration, dose and population relevance.
Vulnerable populations	FDA specifically requested evidence for pregnant/lactating women and young children and raised developmental/physiological concerns.	Some Japanese dossiers use literature and precautionary labeling; product positioning may avoid certain populations.	Regional guidance should define when exclusion, warning or dedicated evidence is required.
ADME / mechanism	Limited human oral ADME information and limited BBB crossing were noted; FDA requested stronger validation across populations.	ADME was generally not included in the summarized FFC examples.	Mechanistic uncertainty should be identified explicitly even if not always a formal dossier requirement.
Drug interactions	FDA raised potential interaction with blood-pressure medication.	Literature review is expected; precautionary warnings for antihypertensive or antiepileptic drugs can be included.	Interaction assessment is a common requirement suitable for regional guidance.

Assessment element	United States GABA experience	Japan FFC experience	Pilot implication
Exposure assessment	US notices estimated intended-use intake and, in later submission, combined background and intended exposure; FDA requested fuller cumulative exposure including supplements.	The summarized FFC dossiers specify recommended daily intake but generally did not include quantitative exposure modeling.	This is a major philosophical difference between the two approaches.
Regulatory conclusion	Both GABA GRAS notices were withdrawn after FDA questions; no FDA no-questions letter was obtained.	Food business operators concluded no safety concerns and notified CAA under FFC; products can be marketed subject to the framework and notifier responsibility.	Different legal pathways can produce different market outcomes from overlapping evidence.