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Agricultural Biotechnology Annual

GE Policy

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Report Highlights:
Singapore has no significant import barriers to products containing GE ingredients or products derived from GE crops. There have been no changes to regulations since the Genetic Modification Advisory Committee (GMAC) revised its Biosafety Guidelines Research in January 2013.

SECTION I. EXECUTIVE SUMMARY:

Singapore imports 90 percent of its food supply, with Malaysia, Indonesia, Australia, the United States and China as the country's main suppliers of agricultural products. U.S. exports of agricultural products to Singapore in 2013 increased 9 percent from 2012. Last year, U.S. exports totaled $753 million. Leading categories included dairy products ($91 million), prepared foods ($87 million), fresh fruit ($60 million), and pork/pork products ($45 million). Singapore imports no U.S. corn, and minimal soybeans, and overall imports of GE material in bulk commodities is negligible. Thus, any imports of GE products would be primarily soy or corn based ingredients contained in further processed products.

Singapore does not produce any agricultural-related GE plants or animals, and there are no current field trials. GE related activities consist of confined laboratory research, primarily related to pharmaceuticals.

The multi-agency Genetic Modification Advisory Committee (GMAC) was established under the country's Ministry of Trade and Advisory in 1999 to oversee and provide science based advice on R&D, production, release, use and handling of GE matters. As an advisory committee, GMAC works closely with other national bodies/regulatory agencies, particularly the Agri-Food and Veterinary Authority (AVA) and Ministry of Health. GMAC formulated Guidelines on the Release of Agriculture-Related GMOS (1999) and Biosafety Guidelines for Research on GMOs (2006, revised in 2008 and January 2013). However, as a non-regulatory committee, GMAC's guidelines are not legally binding. AVA gives final approvals.

Singapore focuses on promoting R&D in agro-technology via the establishment of agro-technology parks. The objective is to become a regional hub for agricultural consultancy and for research on seed technology and agro-technology in tropical agriculture and aquaculture. However, the primary focus is still the biomedical industry, gene therapy, biologics, diagnostics and genetic engineering.

Imported foods must be determined safe by exporting countries' national regulatory bodies and they must comply with international safety standards established by Codex Alimentarius.

SECTION II. PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a) PRODUCT DEVELOPMENT, b) COMMERCIAL PRODUCTION, and c) EXPORTS: Singapore does not cultivate, produce, or export any GE crops.

d) IMPORTS: Singapore imports hardly any GE agricultural products in bulk form. However, it does import a significant quantity of processed foods that contain ingredients (e.g. corn syrup and soybean oil) that were derived from GE grains.

e) FOOD AID RECIPIENT COUNTRY: Singapore does not need and does not receive humanitarian food aid.

PART B: POLICY

a) REGULATORY FRAMEWORK: Under GMAC's Guidelines for the Release of Agriculture-Related GE products, a proposal has to be submitted to GMAC; then to its Subcommittee on the Release of Agriculture-Related GE products will review the application, including examining the GE's origin, the experimental procedures used in development and the methods used to prove they are safe for consumption. The guidelines also provide the framework for conducting the human health and environmental risk assessments. Following the recommendations of the Subcommittee, GMAC will decide whether it will endorse the application. GMAC's decision is then forwarded to AVA, who determines final regulatory approval.

GMAC Committee and Subcommittees: The current GMAC Main Committee is chaired by an official from the National Institute of Education (NIE), with members from 12 different agencies, including AVA, Ministry of Manpower, Ministry of Health, Consumer Association of Singapore, Institute of Molecular and Cell Biology and National Parks Board.

Please click here for the list of current members of the GMAC Main committee.

In addition to the main Committee, GMAC has four subcommittees as follows:

- Subcommittee on Release
- Subcommittee on Research
- Subcommittee on Labelling
- Subcommittee on Public Awareness

- Please click here for a copy of the flowchart for evaluation, approval and registration of agricultural GE in Singapore. (Source: GMAC)

GE Regulatory system in Singapore

- GMAC Guidelines
    - Please click here for a copy of the Singapore Biosafety Guidelines for Research on GMOs (revised January 2013). (Source: GMAC)

    - Please click here for a copy of the Singapore Guidelines on the Release of Agriculture-related Genetically Modified Organisms (GMOs). (Source: GMAC)
        - GE Registration: GMAC manages a register of approved GE products. Once the GEs are approved for release, the GEs are then registered with the GMAC Secretariat.
        - Procedures for notification: Prior to distributing any agricultural GE products, a proposal has to be submitted to GMAC.

Procedures for approval: GMAC will forward the proposal to the relevant Sub-committee; and the latter may endorse/reject the proposal or appoint a relevant agency/expert panel to appraise the proposal in 90 days. The agency will then submit their recommendations to GMAC within the 90 days. GMAC will then decide on the Subcommittee's recommendation within 60 days.

- Regulatory Authority for Food
    - Importation and sale of food, including GE Foods: For the application of import of GE foods, a proposal needs to be submitted to GMAC for their safety evaluation. After GMAC has completed their evaluation, AVA will take into consideration GMAC's recommendations and conduct further safety evaluation based on Codex's "Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants".
    - As a general overarching policy on food safety reviews, Singapore regulatory bodies adopt the concept of "substantial equivalence" – i.e. if a new food or food component is found to be substantially equivalent to an existing food or food component, it can be treated to be as safe as the conventional food or food component.

b) APPROVALS: Please click here for the list of approved agricultural GE crops for use as food or food ingredients in Singapore (Source: AVA)

c) FIELD TESTING: None at this time.

d) STACKED TRAITS: Singapore has prepared a draft on approval of crops containing multiple events or "stacked traits" for the purpose of simplifying the process. The main concern is that the GE crops with multiple events may have to undergo another complete review even if each trait has already been approved individually. However, at this time of writing, nothing has been finalized, and GMAC is currently taking comments into consideration from both industry and academia.

e) ADDITIONAL REQUIREMENTS: None at this time.

f) COEXISTENCE: Since Singapore grows no GE crops, and scarcely any field production of conventional crops, it has no policy on coexistence.

g) LABELING: There is no specific legislation/guidelines on labelling of GE foods. GMAC subcommittee on labelling was created to consider the issue of labelling of GE products. The issue of labelling is receiving increased public attention and is becoming more contentious. However, in recognition that it is a complex issue, including that there is no internationally agreed upon threshold on GE material in food, Singapore has no plans to draft guidelines on labelling soon.

h) TRADE BARRIERS: In general, no barriers exist to imports of U.S. GE products, as long as they have already been approved by U.S. federal agencies. Importers applying to import GE products must first prove that these GEs are considered safe for public consumption in their countries of origin before they are allowed entry into Singapore. Food producers must perform tests on the quality, allergenicity, toxicity, composition and nutritional values of food derived from GEs before these foods are allowed

entry. Foods containing new substances as a result of genetic modification are subjected to additional tests.

i) INTELLECTUAL PROPERTY RIGHTS (IPR): In Singapore, the onus is on the importers to obtain the necessary patents for their GE products so as to ensure the protection of their IPR.

j) CARTAGENA PROTOCOL RATIFICATION: Singapore is a not a party to the Cartagena Protocol on Biosafety.

k) INTERNATIONAL TREATIES/FORA: Singapore is a member of APEC, Codex and also one of the 12 countries negotiating the Trans Pacific Partnership (TPP). Biotechnology constitutes an important part of the overall discussion on food and agricultural matters in APEC. The most recent declaration on biotechnology – at the Third APEC Ministerial Meeting on Food Security in Beijing, on September 19, 2014 – the Ministers declared under the "Promoting sound development of agricultural biotechnology" that "Research, development and application of agricultural biotechnology has played an important role in sustainably increasing agricultural productivity and ensuring food security. We recognize the importance of continuing to support agricultural biotechnology; supporting the development, improvement and adoption of relevant laws and regulations; encouraging research institutions to carry out research and development in agricultural biotechnology; enhancing the research in safety and reliability of biotechnology; developing risk-based control mechanisms and remedial measures against human health, environmental and other risks".

The country is also a member of the International Union for the Protection of New Varieties of Plants (UPOV).

l) RELATED ISSUES: Singapore has a multi-pronged strategy to promote food security, with research and development using modern agriculture technologies playing a key role. For example, the National Research Foundation recently awarded a $8.2 million grant to a joint project between the National University of Singapore, the Temasek Life Sciences Laboratory and the International Rice Research Institute to address food security concerns, including the development of rice strains that can adapt to climate change. In addition, the Economic Development Board encourages companies to establish centers for research, and several life science companies are doing work on crop varieties appropriate for regional tropical growing conditions.

m) MONITORING AND TESTING: AVA monitors for the presence of GE foods in the market, which includes taking samples and testing in AVA laboratories. AVA's laboratory can detect five specific types of GE events and can also quantify GE content in certain food products.

n) LOW LEVEL PRESENCE POLICY: Singapore has no specific policy per se, but in the past has demonstrated a sensitivity to instances of inadvertent release of unapproved events.

PART C: MARKETING

a) MARKET ACCEPTANCE: No significant barriers exist to importing or marketing GE foods in Singapore. In response to a public query on the safe consumption of GE food in Singapore, AVA stated in a 2012 letter that they would like to assure the public that "all GM commercially available in Singapore have undergone safety assessments by both GMAC and AVA based on Codex's principles established by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO)".

b) PUBLIC/PRIVATE OPINIONS: The number of complaints / cautionary letters in public forums has increased, and anti-GE food groups are becoming more vocal. However, overall there is no major opposition to GE foods in Singapore.

<u>GE Labelling</u>

GE food must meet AVA's food safety labelling requirements in terms of ingredient listing, claims, and information. Companies can voluntarily label food as "GMO" or "non-GMO".
AVA's fundamental principle is that any labelling must be "practical, scientifically-driven and effectively implementable across countries". In the future, AVA will likely adopt labelling practices that are in line with these international best practices.

- Public Awareness Campaigns

GMAC has had conducted two public events in 2014 as part of their ongoing efforts to increase public awareness on GE technology and GE foods:

- The GMAC Students Challenge, June 2014
  Organized since 2008, this year's event in June centered on students creating an infographic poster based on the theme "ABCs of GM". 17 schools and 28 teams participated in this year's event. The 10 shortlisted teams presented their posters and answered grueling questions from the judges. There was also a Q&A session with an expert panel to answer public queries on GE technology.
- GMAC Public Forum, May 2014
  GMAC invited a prominent agricultural economist and consultant to deliver a key lecture in May this year on the global and environmental effects of GE crops from 1996 to 2012. The lecture addressed the benefits of GE crops, including improved environmental effects, decreased dependence on pesticides/herbicides, and increased yield. It was followed by a Q&A session. The lecture was based on two reports – see the details at www.pgeconomics.co.uk

- GMAC Public Forum, September 2014
  GMAC hosted U.S. State Department's Senior Advisor for Biotechnology for a talk on "Can Agriculture Save the Planet Before It Destroys it?" The presentation discussed global trends on food and agriculture pertaining to science and technology.

c) MARKETING STUDIES: None at this time

PART D: CAPACITY BUILDING AND OUTREACH

a) ACTIVITIES: In 2014, the Office of Agricultural Affairs (OAA) in Singapore met with GMAC representatives to discuss new developments in GE policy and regulations. In conjunction with the visit to Singapore of a Biotech senior advisor for the State Department, the OAA office organized dialogues with major life sciences and food/ agriculture companies. Also, outreach initiatives have been made toward several biotech groups, including CropLife Asia (www.croplifeasia.org)

b) STRATEGIES AND NEEDS: To educate regulators about the advantages of biotechnology in agriculture and to support implementation of a practical regulatory framework, FAS and interagency partners could potentially do:

- Workshops/seminar: To present information on GE technology and exchange ideas and experiences.
- Capacity building programs: Use Singapore as the lead country for the ASEAN GE Food Testing Network (AGMFTN). FAS could conduct trainings for other ASEAN countries in Singapore to strengthen their GE food testing capabilities.
- Research projects: Collaborate with GMAC on research/evaluation projects.

SECTION II. CHAPTER 2: ANIMAL BIOTECHNOLOGY

a) PRODUCT DEVELOPMENT: Singapore's animal biotechnology can be described as very minimal at best and constitutes only R&D activities. One of AVA's technical and R&D centers is the Marine Aquaculture Center (MAC), located at St. John's Island. The MAC has undertaken several R&D activities to develop large-scale hatchery technology, including fish biotechnology and other upstream molecular applications – i.e. the genetic selection to facilitate fish breeding, and development of fish vaccines and diagnostic kits.

b) COMMERCIAL PRODUCTION, c) EXPORTS and d) IMPORTS: There is no commercial production/exports/ or imports of GE animals or animal products.