

GM Food Newsletter

DEC 2017

Published by the Centre for Food Safety



Is there any genetically modified animal for food use in the market?

For the first time since the commercialisation of genetically modified (GM) food more than two decades ago, an accumulated hectareage of over 2 billion hectares of GM crops have been grown all over the globe. In contrast, GM food animals are less common. The world's first commercialised GM food animal, a GM salmon, was only approved for human consumption in 2015 and entered the food supply in recent months.

The GM Salmon

Salmon is a good source of protein and omega-3 fatty acids. Among the different types of salmon, the production of farmed Atlantic salmon constitutes more than 50 percent of the total global salmon market. To shorten the production cycle, Atlantic salmon was genetically engineered to contain a promoter sequence of an ocean pout and a Chinook salmon growth hormone gene (Figure 1). This promoter keeps the growth hormone gene turned on also during cold periods which enables the GM salmon to grow year-round instead of only during spring and summer. As a result, the transgenic salmon grows faster and reaches mature size earlier than its non-GM counterpart (18 months compared to the typical three years).

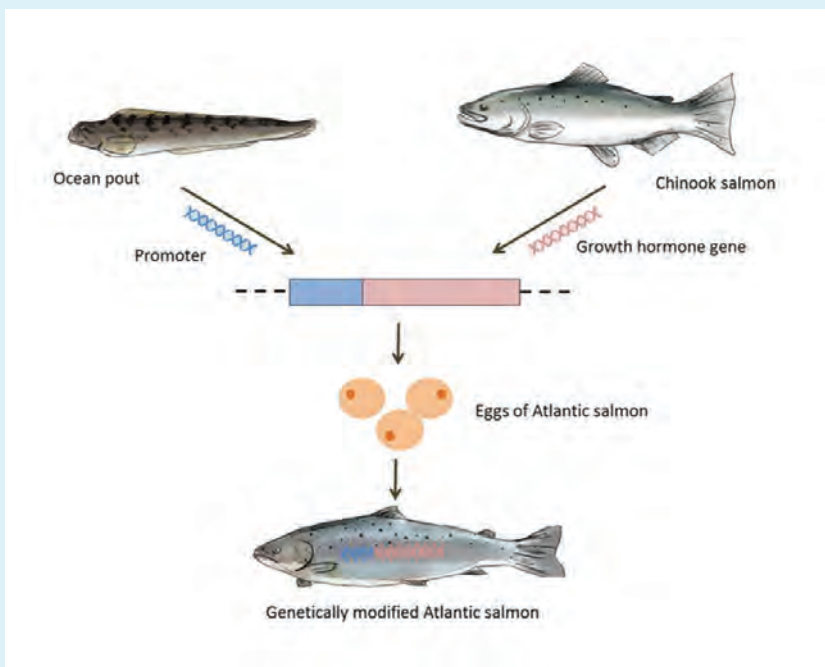


Figure 1: The GM salmon was developed by inserting a promoter sequence of ocean pout and the growth hormone gene of Chinook salmon into fertilised Atlantic salmon eggs. The GM salmon grows more rapidly during early-life and reaches market size sooner.

Safety Assessment of GM Salmon

Like any other GM food available on the international market, the GM salmon has to undergo a vigorous safety assessment by competent authority prior to commercialisation. The evaluation considers both the direct and indirect effects arising from the genetic modification and addresses the issue of whether food derived from the GM organism is safe for human consumption (Figure 2). Developer of the GM organism has the responsibility to demonstrate the safety of its product and submits data to relevant authorities for assessment.

As part of the safety assessment, scientists of the US FDA considered the data provided by the applicant as well as other sources of data and information, including articles from peer-

In November 2015, the US Food and Drug Administration (FDA) determined that the mentioned GM salmon is as safe and nutritious as any non-GM Atlantic salmon following its safety review.

reviewed journals, to assess how the salmon was developed, the potential toxicity to consumers, and the potential allergenicity of the Chinook salmon growth hormone, along with changes in the levels of hormones that could potentially be affected by the expression of the growth hormone gene. The unintended effects arising from the insertion of the DNA sequence, including possible effects on the composition and allergenicity of the GM salmon relative to farm-raised Atlantic salmon are also reviewed. In addition, the US FDA evaluated the health status of the GM salmon and its susceptibility to disease under aquaculture conditions in which they are raised. The approach taken for safety assessment of food from the GM salmon is consistent with that recommended by the Codex Alimentarius Commission¹. This marks the first GM animal product approved for sale as food.

Later in May 2016, an independent safety review conducted by Health Canada reached similar conclusion and the GM salmon was allowed to be sold in the Canadian market. The approach for safety assessment of GM food taken by the US and Canada is similar to that applied by regulatory agencies around the world in countries and places such as the European Union, Australia, New Zealand and Japan.

Proposed Pre-market Safety Assessment Scheme in Hong Kong

According to the World Health Organization, GM food currently available for sale in the international market has passed safety assessments of the food safety regulatory bodies of the relevant countries or places and is not likely to present risk for human health. Despite this, such situation may change in the future as more and more GM foods are being developed, therefore a pre-market safety assessment scheme of GM food is proposed to provide a further safeguard to enhance the food safety control over GM food and provide the legal basis for preventing unauthorised GM food from entering into the local market.

Similar to the practice of other countries and places, under the proposed pre-market safety assessment scheme, a GM food developer who intends to place a GM food on the local market would be required to submit an application together with the necessary supporting documentation to the Centre for Food Safety (CFS). The CFS will determine whether the GM food developer has adequately addressed the safety issues based on Codex principles and guidelines. GM food which consists of, or is derived from, GM microorganisms, plants or animals must pass the safety assessment before it may be sold in Hong Kong. In this regard, the Government will continue to monitor the international development on regulation of GM food and the local circumstances.

¹ Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Animals



Figure 2. The safety assessment of GM food includes analyses of the transgenic proteins and their metabolites for potential toxic and allergic effects, compositional analyses and the evaluation of potential changes in the nutritional value and processing characteristics of the GM food.

For more information on GM food, please visit our website

http://www.cfs.gov.hk/english/programme/programme_gmf/programme_gmf.html