

Triple Quadrupole Technology for Halvec Lab's novel routine gelatin analysis and targeted markers for identification of porcine trace elements

In Malaysia, scientists from Halvec Laboratories Sdn. Bhd. (Halvec Lab) are working in collaboration with Thermo Fisher Scientific to deliver an international reference method for gelatin analysis for food, pharmaceutical and personal care products.

With this reliable method, commercial and governmental entities can inexpensively test and authenticate products quickly, efficiently and effectively for millions of consumers around the world.

Halvec Lab will be using the Thermo Scientific™ TSQ Quantis™ Triple Quadrupole Mass Spectrometer and the award-winning Thermo Scientific™ TSQ Altis™ Triple Quadrupole Mass Spectrometer, named as one of 2017 Top 10 Innovations by The Scientist, a global magazine based in North America. Together, these products offer users a workflow solution that delivers superior data quality with a robust, sensitive, reproducible, and reliable targeted quantitation.



Halvec Laboratories in Malaysia



Thermo Scientific™
TSQ Altis™
Triple Stage
Quadrupole mass
spectrometer



Nor Amin, CEO, Global Haltech at the entrance to Halvec Lab

Social Case Against Gelatin

Gelatin is a translucent, colorless and flavorless protein found in collagen obtained from various animal parts. Although largely animal-based, there are plant-based alternatives to gelatin including agar-agar, carrageenan, pectin and konjac.

Gelatin is used in food such as candies and puddings, cosmetics and personal care products such as shampoos and face masks, capsules used in pharmaceutical drugs and vitamins, and it is even used in photography.

The consumption of gelatin may be forbidden by cultural, religious and social norms. For instance, vegans do not consume gelatin from animal sources. Practitioners of various religions are also highly concerned about the source of gelatin.

“Most of the food, beverage, cosmetics, pharmaceutical and supplement products in the market contain gelatin, and that about half the global supply of raw gelatin comes from pigs,” says Nor Amin Mohd Noor, Chief Executive Officer (CEO) of Global Haltech Sdn Bhd which owns Halvec Lab.

“This is a major concern for practitioners of religions, particularly, Islam. Current testing methods are unable to work on highly processed ingredients which contain degraded DNA.”

Halvec Laboratories

Based in Kuala Lumpur, Malaysia, Halvec Laboratories is an ISO 17025 accredited service laboratory offering halal science testing and verification services for a

Halvec hopes to be first in the world to launch a routine application for gelatin analysis as a standard in the halal science ecosystem.

wide spectrum of products used in food, agricultural, cosmetics, personal care, pharmaceutical and medical industries.

ISO 17025 enables laboratories to demonstrate that they operate competently and generate valid results, thereby promoting confidence in their work both nationally and around the world.

Halvec is part of Global Haltech, an expert in halal science - the systematic, logical and evidence-based explanation of natural phenomena relating to that which is permissible or lawful under Islam’s Sharia Law.

“The protocol of analyses that we deploy is accredited under ISO 17025 which ensures accuracy, integrity and reliability of the results,” says Nor Amin.

“We are always advocating the highest standards of integrity, accuracy and competency by participating regularly in official proficiency testing programs.”

Halvec has been in close cooperation with agencies and manufacturers from Japan, Korea, Indonesia, Thailand, Europe and the Gulf coast countries to perform tests to determine the origin of gelatin in cosmetics.

Global Challenge

In late 2017, Halvec decided to tackle a bigger challenge – Nor Amin and his team wanted to solve a global problem of identifying the animal origins of common proteins used in food, pharmaceutical and personal care products.

“For highly processed proteins such as gelatin, which could be from different meat sources, there is no routine application specially developed for use by product manufacturers and standard bodies to test and verify its origins,” he says.

“With a novel routine application developed, both halal certification bodies and manufacturers of personal care, pharmaceuticals and food will have a standard method for meat speciation of gelatin,” says Nor Amin.

Additionally, Halvec plans to create a set of targeted markers to help labs identify porcine trace elements easily. By using a set of markers instead of relying on just one particular marker, the labs will have a set of clear, robust and comprehensive targeted markers.

Work In Progress

In Halvec’s lab, scientists collaborate with Thermo Fisher Scientific’s application experts located in different countries such as Singapore and United States on a number of projects.

One project involves the detection of gelatin in cosmetics with the aim of developing qualitative detection methods using liquid chromatography triple quad (LC-QQQ).

Halvec is using **Thermo Scientific™ TSQ Altis™ Triple Stage Quadrupole mass spectrometer** and **Thermo Scientific™ Vanquish™ Flex Binary UHPLC System, Thermo Scientific™ TraceFinder™ 4.1 software** and **Thermo Scientific™ Hypersil GOLD™ HPLC and UHPLC columns** to aid them on their stringent research.

Halvec’s team is keen to have novel methods for the quantitation of specific markers in personal care, food and pharmaceutical industries. Should there be a permissible gelatin that is safe for consumption, Halvec wants to have a reliable method to authenticate that.



“We want to disseminate our results to the global analytical community with complete workflows – from sample preparation, analytical analysis to data processing and reporting.” – Nor Amin.

“These are all part of our vision to ensure that consumers of various cultures and religions enjoy products that are safe for consumption.”

Thermo Fisher Scientific’s collaboration with Global Haltech is a positive step forward in helping manufacturers meet their scientific and regulatory goals.



Interview with Nor Amin Mohd Noor, Chief Executive Officer (CEO) of Global Haltech Sdn Bhd, an active member of Malaysia's Halal Science community.

Nor Amin is often invited to serve as a speaker on this topic in major industry conferences and workshops worldwide.

A registered chemist, Nor Amin has led major projects such as Halalcopeia to build a database of Halal and forbidden pharmaceutical, nutraceutical and cosmeceutical products, method development of halal slaughtered meat, and a database on halal and forbidden emulsifiers and preservatives.

Q. What are the gaps in halal tests that your team at Halvec Lab want to address?

A major challenge that we face is at the sample level – degradation of DNA in the highly processed products that we receive for testing. The degraded DNA makes the sample unsuitable for current methods of DNA analysis.

Also, the bulk of the samples that we receive are gelatin-based samples or samples that contain gelatin. In some products, the DNA had already degraded. We need to look at alternative methods of sample testing such as using polypeptide analysis to address this challenge.

Q. Regarding gelatin, why are there concerns and what are the challenges halal science specialists like Halvec Lab aim to address?

Gelatin is a major concern as about half of the world's raw gelatin supplies are derived from pigs which is forbidden under Islamic law. As gelatin is used in a wide variety of goods ranging from food, beverage, cosmetics, pharmaceuticals and nutraceuticals, labs around the world need simple yet effective tests that can be applied in a variety of applications.

Halvec Lab's mission is to help these commercial and regulatory labs test products to ensure that these do not contain ingredients forbidden for consumption. Our tests must be rigorous, and our findings must always be accurate.

With our application method and a set of robust and comprehensive targeted markers, labs worldwide will be empowered to deliver results with accuracy and efficiency.

Q. Why did Halvec Lab choose to work with Thermo Fisher Scientific? How has that collaboration been so far?

As a leader in method development and a champion of Halal analysis, we want to work only with the world leader in serving science. Thermo Fisher Scientific understands our scientific goals and have some of the industry's most innovative technologies to solve the most complex analytical challenges.

Since we began collaborating on this method development, we have attained successes in developing polypeptide's targeted marker for halal analysis in gelatin-based products.

We are highly confident that our collaboration work will yield positive outcomes that can help labs around the world and cement Malaysia's reputation as the world's leading halal testing hub.

What is Halal?

Halal is an Arabic word for "permissible", referring to what is permissible or lawful in traditional Islamic law (also known as Sharia Law).

The opposite of halal is haram/ non-halal which means forbidden and prohibited. Muslims must ensure that all foods and non-food items like cosmetics and pharmaceuticals are halal. Forbidden foods include pork and those that are not in a state of purity such as blood and intoxicants.

The worldwide market for halal products is estimated to reach US\$3.7 trillion in 2019. Manufacturers of food, pharmaceutical and personal care products need robust testing methods for gelatin analysis to meet the most stringent halal certification requirements.

Find out more at www.thermofisher.com/ConfidentQuantitation

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