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Panel on Food Safety and Environmental Hygiene

Background brief prepared by the Legislative Council Secretariat for the meeting on 12 November 2019

Study on "cooking oils in use" and formulation of guidelines on good practice of using frying oils

Purpose

This paper provides background information on the Administration's consultancy study on "cooking oils in use" and proposed formulation of guidelines on good practice of using frying oils, and summarizes major views and concerns of members of the Panel on Food Safety and Environmental Hygiene ("the Panel") on the subject.

Background

2. The "substandard lard" incident occurred in Taiwan in 2014 raised public concern in Hong Kong over the safety and quality of edible fats and oils. To strengthen the protection of the safety of edible fats and oils, the Administration has followed up along various aspects, including (a) introducing administrative measures to regulate the recycling of "waste cooking oils", (b) regulating the metallic contaminants and harmful substances in edible fats and oils, and (c) conducting a consultancy study on "cooking oils in use" with a view to formulating guidelines on good practice of using frying oils for the trade's reference.

Consultancy study on "cooking oils in use"

3. According to information provided by the Administration to the Panel in December 2017, the level of harmful substances and the quality of cooking oils may change during the course of cooking. The changes are mainly due to the

reaction between the frying oils and (a) the food, (b) moisture and (c) oxygen in the air. During frying, high temperature would result in thermal reaction of the frying oils and at the same time, the moisture in the food would be evaporated and released into the oils, resulting in hydrolysis. The oxygen in the air would also cause oxidation of the frying oils. Some food premises/caterers may cook food with the same pan of cooking oils for more than once (so-called "reused oils" or "cooking oils in use") and mix "reused oils" or "cooking oils in use" with other oils during cooking. Since the catering industry adopts diversified cooking methods, the trade has called on the Administration to provide some guidelines and suggestions on the use of "reused oils", with specific recommendations having regard to the circumstances of the industry (e.g. the maximum number of times the oils could be reused before they have to be disposed of), for the trade's reference and adoption.

4. Since the number of times that oils could be reused depends on multiple factors, including the oil type, cooking temperature, cooking time, type and amount of food fried and storage condition, the Administration considers it necessary to take a careful and pragmatic approach to gain a better understanding of the general situation of using "reused oils" by different sectors in the local catering industry. The Administration also sees a need to observe the actual operation of the local trade and make reference to international experience, in order to formulate feasible guidelines on good practice of using frying oils.

5. Against this background, the Centre for Food Safety ("CFS") of the Food and Environmental Hygiene Department ("FEHD") commissioned, in September 2017, the Hong Kong Polytechnic University ("PolyU")'s Technology and Consultancy Company Limited ("Study Consultant") to conduct a study with a view to formulating guidelines on good practice of using frying oils. The consultancy study, which focused on assessing the level of harmful substances and the changes in quality of cooking oils after repeated uses for frying seafood and vegetables¹, was expected to be completed in mid-2019.

Members' concerns

6. At the meeting on 12 December 2017, the Administration briefed the Panel on the progress of the consultancy study and formulation of the guidelines. Members' major views and concerns are summarized below.

¹ According to the Administration, some seafood and vegetables may have higher level of arsenic and lead. The release of those metals from those foods into cooking oils during frying may, therefore, have higher concern.

Proposed scope and methodologies of the consultancy study

7. Concern was raised on how the findings of the consultancy study and the good practice to be recommended would complement the proposed regulation of edible fats and oils and recycling of "waste cooking oils" in the future. Some members opined that to ensure the catering industry's receptiveness to those recommendations, the Administration should fully consult the trade before formulating the guidelines.

According to the Administration, the relevant safety standards for edible 8. fats and oils were stipulated in the subsidiary legislation under the Public Health and Municipal Services Ordinance (Cap. 132) ("PHMSO"). It, however, was not a common practice in other countries/places to apply the same set of safety and quality standards for fresh oils to "reused oils" or "cooking oils in use". The level of harmful substances and the quality of cooking oils might change in the course of cooking. Since there were diversified cooking methods among the catering industry, the Administration considered it more appropriate to commission the study and to issue a set of guidelines on good practice on the use of "reused oils", with specific recommendations having regard to the circumstances of the catering industry, for its reference and adoption. The consultancy study would be conducted in five stages. The Administration assured members that before submitting the final draft of the guidelines to CFS, the Study Consultant would consult and invite the trade to try out the recommendations proposed to be included in the guidelines so as to assess the operability of and the trade's receptiveness to those recommendations.

9. The Administration further advised that in formulating the guidelines, the Study Consultant would, other than taking samples of cooking oils in use from selected food premises for testing, conduct its own frying seafood and vegetable experiments based on the information obtained from the market surveys and the views expressed by the trade. Laboratory analyses would include arsenic, lead, benzo[a]pyrene, aflatoxins, erucic acid, acid value and total polar compounds, etc. The purpose was to evaluate the changes of different safety and quality parameters of cooking oils during frying in order to make the guidelines more specific.

10. Some members were concerned that the guidelines would have no binding effect on local food premises. In these members' view, to ensure the safety of edible fats and oils, the Administration should regulate and specify comprehensively safety standards for edible fats and oils and should strengthen the regulation of metallic contaminants and harmful substances in edible fats and oils through legislative means. There was a suggestion that the Administration should consider publicizing information on the quality of cooking oils used by food premises to facilitate consumers to make informed dining choices.

11. According to the Administration, the Food and Health Bureau ("FHB") and CFS had completed the public consultation on the proposed regulation of metallic contaminants (arsenic and lead) and harmful substances (erucic acid, aflatoxins and benzo[a]pyrene) in edible fats and oils. The proposed regulation involved amending various items of subsidiary legislation under PHMSO. The Administration would kick start the legislative exercise gradually. FHB and CFS had also completed the public consultation on the proposed amendments to the Food Adulteration (Metallic Contamination) Regulations (Cap. 132V) which sought to, among others, specify metallic contamination standards for individual food/food groups which covered also edible fats and oils.² These apart, the Administration was also working on proposals to update the regulatory regime of harmful substances in food, including industrially-produced trans fats and mycotoxins. It planned to conduct public consultation on the proposals in 2020.

Recycling of "gutter oils"

12. Some members expressed disappointment that the consultancy study did not cover the regulation of recycled use of "gutter oils". They urged the Administration to conduct studies to find out whether there was any testing method for detecting whether the oils used in cooking were "gutter oils", so that the Administration could introduce effective measures to prevent substandard cooking oils from re-entering the local food chain as edible oil products.

13. The Administration advised that that there was no universal or generally accepted testing standard to identify the so-called "gutter oils" in the international arena. Regulatory authorities in other jurisdictions only focused on testing for or identifying harmful substances possibly present in the so-called "gutter oils", and used the testing results as a reference indicator of whether the oils concerned were fit for human consumption, but it was impossible to determine whether they were "gutter oils". PHMSO stipulated that all food for sale must be fit for human consumption. This requirement covered all food including edible fats and oils. The subsidiary legislation under PHMSO regulated the individual safety standards of food, including edible fats and oils.

² The Administration briefed the Panel on the outcome of the public consultation exercise at the meeting of 9 January 2018. On 8 June 2018, the Administration published in the Gazette the Food Adulteration (Metallic Contamination) (Amendment) Regulation 2018 ("the Amendment Regulation") (L.N. 113 of 2018) to revise/update the maximum levels for 14 metallic contaminants in food. The Amendment Regulation was tabled before the Legislative Council on 13 June 2018 and was subject to the negative vetting procedure. The Amendment Regulation comes into operation on 1 November 2019.

CFS had been monitoring the quality of local edible fats and oils by taking samples at the import, wholesale and retail levels for chemical testing under its regular Food Surveillance Programme. To facilitate recycling and prevent "waste cooking oils" from being illegally processed into edible oils, FEHD had imposed additional licensing conditions to require all restaurants, factory canteens, food factories and bakeries to hand over their "waste cooking oils" to collectors, processors and exporters registered with the Environmental Protection Department. The new licensing conditions had come into effect gradually since November 2017.

14. Some members expressed concern that some food premises might use the cooking oils repeatedly and mix "reused oils" with other oils. They enquired whether there were testing methods for assessing the safety and quality of cooking oils used by food premises. There was a suggestion that the Administration should study whether it was feasible to detect "gutter oils" by using DNA analysis or by testing the level of sulphur (commonly found in "gutter oils") in the oils.

According to the Administration, the detection of "gutter oils" mainly 15. involved the discovery of certain food residue markers or toxic and carcinogenic chemicals in the oil samples. However, due to the diverse groups of compounds that might be found in "gutter oils" and the fact that target compounds could be removed during processing, a universal strategy to detect gutter oils was not available at present. Nevertheless, PolyU researchers had developed a simplified method for direct analysis of edible oils using matrix-assisted laser desorption/ionization mass spectrometry ("MALDI-MS"). The MALDI-MS approach only involved simple sample preparation, automatic data acquisition and simple data processing. High quality and highly reproducible MALDI-MS spectra results could be obtained using this method, and a spectral database of labeled edible oils available in the market had been set up. Since different types of edible oils had different MALDI-MS spectral patterns, the authenticity of an edible oil sample could then be determined within five minutes by comparing its MALDI-MS spectrum with that of those labeled oils in the established database. This method was capable of authenticating edible oils and also enabled a rapid screening of gutter oils.

Latest developments

16. The Administration will update members on the progress of the consultancy study and formulation of the guidelines at the Panel meeting on 12 November 2019.

Relevant papers

17. A list of relevant papers on the website of the Legislative Council is in the **Appendix**.

Council Business Division 2 Legislative Council Secretariat 6 November 2019

Relevant papers on study on "cooking oils in use" and formulation of guidelines on good practice of using frying oils

| Committee | Date of meeting | Paper |
|---|-------------------------|-------------------|
| Panel on Food Safety and Environmental | 12.12.2017 (Item VI) | Agenda Minutes |
| Hygiene | | |

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