UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022

COURSE NAME : FOOD CHEMISTRY & BIOCHEMISTRY

COURSE CODE : BWD 21203

PROGRAMME CODE : BWD

EXAMINATION DATE : JANUARY / FEBRUARY 2022

DURATION : 3 HOURS

INSTRUCTION : 1. ANSWER **ALL** QUESTIONS

2. THIS FINAL EXAMINATION IS AN **ONLINE** ASSESSMENT AND CONDUCTED VIA **OPEN BOOK**

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

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Q1. (a) Consumers' decision to purchase meat in a retail store are influenced by factors such as juiciness, tenderness, flavour, package appearance, colour, size, food safety *etc.*
Keputusan pengguna untuk membeli daging di kedai runcit dipengaruhi oleh faktor seperti tahap mempunyai jus, kelembutan, rasa, rupa bungkusan, warna, saiz, keselamatan makanan, dan sebagainya.

(i) Aroma and taste combine to form flavour. What is the between aroma and taste?
Aroma dan rasa bergabung membentuk perisa. Apakah perbezaan antara aroma dan rasa?

(3 marks)

(ii) Outline **THREE (3)** elements that could influence the flavour of poultry.
*Nyatakan **TIGA (3)** unsur yang boleh mempengaruhi rasa daging ayam ternakan.*

(6 marks)

(iii) Discuss the precautions of preventing the off-flavours in poultry's flavour.
Bincang langkah berjaga-jaga bagi mengelakkan perisa menjadi rosak daripada terbentuk dalam daging ayam.

(6 marks)

(b) The term "marbling" refers to the white flecks of intramuscular fat that appear throughout each cut of meat as shown in **Figure Q1(b)**. Marbling imparts a great deal of flavour and can be a good indicator of the quality of the beef. Discuss the role of fat in the palatability of meat.
*Istilah "marbling" merujuk kepada bintik-bintik putih lemak intramuskular yang muncul pada setiap potongan daging seperti ditunjukkan dalam **Rajah Q1(b)**. "Marbling" memberikan banyak perisa dan boleh menjadi penunjuk yang baik untuk kualiti daging lembu. Bincangkan peranan lemak dalam keenakan daging.*

(10 marks)

Q2. (a) Show how does catalysis contribute to green chemistry principles.
Bagaimanakah pemangkinan menyumbang kepada prinsip kimia hijau.

(5 marks)

(b) Distinguish the characteristics of the major classes of catalysts used in green chemistry.
Bezakan ciri-ciri kelas utama mangkin yang digunakan dalam kimia hijau.

(10 marks)

(c) Discuss the potential for renewable energy generation from carbohydrate-based food processing waste.
Bincangkan potensi penjanaan tenaga boleh diperbaharui daripada sisa pemprosesan makanan berasaskan karbohidrat.

(10 marks)

Q3. (a) Which postharvest techniques would you recommend in order to accomplish the following objectives?

Teknik lepas tuai yang manakah akan anda cadangkan untuk mencapai objektif berikut?

    (i) To store fresh apples with minimum quality degradation for 9 months.

    Menyimpan epal segar dengan penurunan kualiti yang minimum selama 9 bulan.

(2 marks)

    (ii) To reduce the occurrence of internal disintegration and the severity of symptoms in peaches.

    Mengurangkan berlakunya penghancuran dalaman dan keterukan (keakutan) gejala dalam buah pic.

(2 marks)

    (iii) To prevent grapes and strawberries from decaying.

    Mencegah anggur dan strawberi daripada mereput.

(2 marks)

    (iv) To prevent the effects of ethylene exposure on cut carnation flowers.

    Mencegah kesan pendedahan etilena pada bunga carnation yang dipotong.

(2 marks)

    (v) To prevent potato tubers from turning green.

    Mencegah ubi kentang daripada menjadi hijau.

(2 marks)

(b) Throughout the course, temperature control has been emphasised as the primary parameter available to the postharvest horticulture for preserving the freshness of fresh flowers, fruits, and vegetables. Briefly outline the relationship between temperature control and the following:

Sepanjang tempoh kursus, pengawalan suhu ditekankan sebagai parameter penting untuk hortikultur lepas tuai bagi memelihara kesegaran bunga, buah buahan dan sayur sayuran. Gariskan secara ringkas hubungkait antara pengawalan suhu dengan perkara berikut:

    (i) Physiological abnormalities.

    Keabnormalan fisiologi.

(5 marks)

    (ii) Water evaporation.

    Penyejatan air.

(5 marks)

(iii)   Respiratory system.
Sistem pernafasan.

(5 marks)

Q4.   The colour of meat after it has been slaughtered is determined by the composition of the muscle of origin, the process by which that muscle is converted to meat, and the conditions in which that meat is preserved.
Warna daging selepas ia disembelih ditentukan oleh komposisi otot binatang tersebut, proses di mana otot itu ditukar kepada daging, dan keadaan di mana daging itu diawet.

(a)   Make **ONE (1)** hypothesis regarding how postmortem pH changes affect muscle colour.
*Nyatakan **SATU (1)** hipotesis tentang bagaimana perubahan pH postmortem mempengaruhi warna otot.*

(5 marks)

(b)   Meat tenderness could be improved by employing acetic acid in the marinate. Propose how colour could be used to signify meat tenderness when acid marination is used.
Kelembutan daging boleh dipertingkatkan dengan menggunakan asid asetik dalam perapan. Cadangkan bagaimana warna boleh digunakan untuk menunjukkan tahap kelembutan daging apabila perapan asid digunakan.

(6 marks)

(c)   The shelf life of poultry is determined by a number of factors. Classify **THREE (3)** strategies for extending the shelf life of a meat product.
*Jangka hayat daging ayam itik (ternakan) ditentukan oleh beberapa faktor. Kelaskan **TIGA (3)** strategi untuk memanjangkan jangka hayat produk daging tersebut.*

(6 marks)

(d)   Demonstrate **TWO (2)** factors that contribute to the toughness of meat.
*Tunjukkan **DUA (2)** faktor yang menyebabkan daging menjadi keras.*

(8 marks)

-    **END OF QUESTIONS**   -

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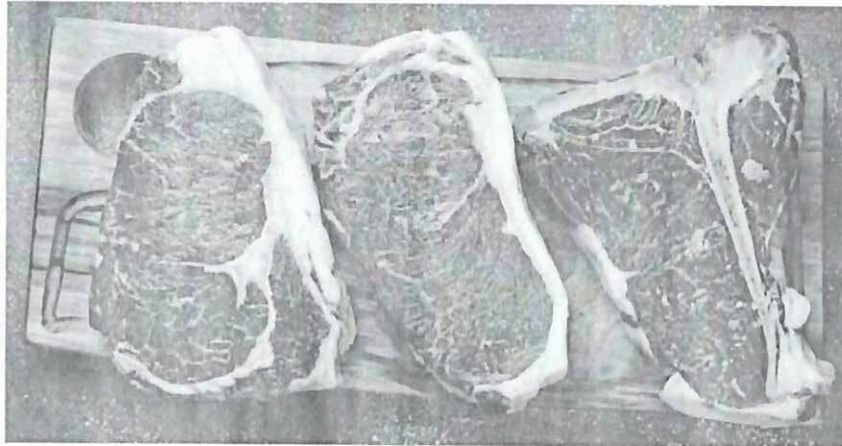
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Figure Q1(b)