DSR STANDARD

DSR 01:xxxx

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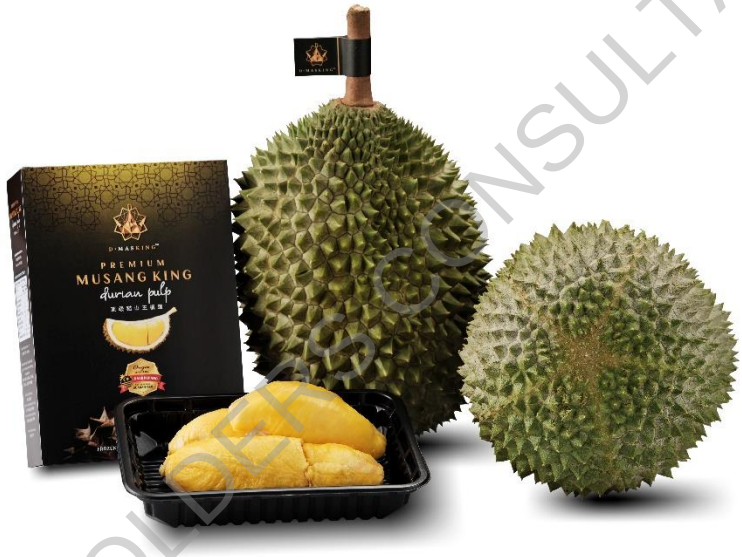


DSR
Malaysia Durian Musang King
Standard

Contents

Foreword

This standard was developed by the Project Committee on DSR Standard established by SIRIM Berhad.

This standard was developed with the following objectives:

a) to provide guidance to DSR and consumers for specification of Musang King Durian (D197) grown from *Durio zibethinus* L. to be supplied in whole fruit, fresh pulp, frozen pulp and frozen paste; and

b) to be used as a basis document for the purpose of product certification.

This standard will be subjected to review to reflect current needs and conditions. Users and other interested parties may submit comments on the contents of this standard for consideration into future versions.

Information to assist users of the standard

For the purposes of this standard, the following ISO definitions have been adopted regarding verbal forms for the expression of provisions:

a) "**shall**" indicates an auditable **requirement**: it is used to indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted;

b) "**should**" indicates a **recommendation**: it is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited;

c) "**may**" indicates a **permission**: it is used to indicate a course of action permissible within the limits of the document; and

d) "**can**" indicates a **possibility** or a **capability**: it is used for statements of possibility and capability, whether material, physical or causal.

Compliance with this standard does not by itself grant immunity from legal obligations.

DSR Malaysia Durian Musang King Standard

0. Introduction

0.1 Malaysia Durian Musang King

Durian (*Durio* Spp.) is a seasonal fruit that is extensively grown in tropical regions, including Malaysia. *Malaysia Durian Musang King* is a registered Geographical Indication (GI) with the Intellectual Property Corporation of Malaysia (MyIPO), licensed to the Department of Agriculture (DOA), and recognised as a cultivated variety of durian (*Durio zibethinus* L.) under the registration code D197. It is currently one of the leading varieties, particularly for the export market. Based on the demands of specific markets, Malaysia Durian Musang King is marketed either as a whole fruit, fresh pulp, frozen pulp or in paste form to local and overseas customers.

0.2 DSR Taiko Berhad

DSR Taiko Berhad (DSR) is an integrated durian producer operating across the entire plantation to market value. The history of DSR began with the durian agribusiness by acquiring two parcels of agricultural land totalling 3.4 acres in Raub District of Pahang. Since DSR began its operations, Musang King Durian trees have been the core cultivar, contributing to 5,058 of the 5,677 durian trees planted with a combined agricultural landbank of 125 acres in Raub and Bentong. Since its inception, DSR has evolved into an integrated durian producer, leveraging proprietary innovation to enhance operational efficiency and traceability across the value chain. The company is committed to offer a diverse range of innovative downstream durian-based products, supported by quality and safety certifications that reinforce authenticity and source. Through the vertically integrated approach, DSR has established the principles of Safety Originality Quality (SOQ) Framework (see Annex A), as the foundation of DSR brand, ensuring that every product it delivers is not only innovative but is also of high quality, genuinely sourced, and safely produced.

0.3 Products of DSR Taiko Berhad

DSR produces *DSR Malaysia Durian Musang King* whole fruits, fresh pulp, frozen pulp, frozen paste and a range of high-quality downstream products. A full list of these products is provided in Annex B.

DSR ensures that all export products contain *DSR Malaysia Durian Musang King,* sourced from its own orchards, which are registered with the Department of Agriculture (DOA) under the *Pendaftaran Ladang Eksport* program, as only registered orchards are permitted for export.

0.4 Sustainability (ESG)

Sustainability is treated as an important part of operations at DSR Taiko Berhad. Initiatives have been put in place to meet ESG objectives in line with SIRIM 55 and GRI Standards. Sustainability principles are applied across all activities, including cultivation, harvesting, grading, transportation, production, and retailing. The main measures taken are:

a) Resources are used efficiently by reducing water, energy, and materials, and by cutting waste.

b) Responsible sourcing is practiced by working with suppliers who follow ethical, environmental, and social standards.

c) Greenhouse gas emissions are lowered through energy-saving methods, better logistics, and renewable energy use.

d) Communities and stakeholders are supported through fair employment and socio-economic development.

e) Performance is improved continuously by monitoring and reviewing sustainability goals.

These steps ensure environmental care, social responsibility, and compliance with sustainability standards (i.e. SIRIM 55 and GRI).

1. Scope

This standard specifies the requirements for Musang King Durian (D197) grown from *Durio zibethinus* L. in the form of:

a) whole fruit;

b) fresh pulp;

c) frozen pulp; and

d) frozen paste.

It covers requirements for the selection of seedling, specification of the fruit, good agronomic practices, harvesting and post-harvest activity, export requirements, production of downstream products (i.e. fresh pulp, frozen pulp and frozen paste) and traceability of the fruit along the supply chain.

2. Normative references

The following normative references are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the normative reference (including any amendments) applies.

Environment Quality Act 1974

Environment Quality Regulations 1979

Federal Agricultural Marketing Authority Act 1965 [Act 141]

Federal Agricultural Marketing Authority (Grading, Packaging and Labelling of Agricultural Produce) Regulations 2008

Food Act 1983

Food Regulations 1985

Food Hygiene Regulations 2009

Malaysian Quarantine and Inspection Services Act 2011 [Act 728]

Pesticides Act 1974

MS 1500, Halal food - General requirements

MS 1480, Food safety according to Hazard Analysis and Critical Control Point (HACCP) system

MS 1784, Good Agricultural Practice (GAP) - Crop commodities (Second revision)

MS 2431, Durian specification

FS092: 2018, Standard durian musang king D197 (Durio zibethinus L.)

Pakej Teknologi Durian by Department of Agriculture (DOA)

Sistem Maklumat Racun Perosak (SISMARP)

Teknologi Durian MARDI, 2022

3. Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1 damage

Any injury caused by pests and/or diseases infestation, mechanical and/or physiological means, which materially affects the appearance, internal, keeping and eating quality of the fruit.

3.2 defects

The characteristics which affect the appearance and shape.

3.3 integrated pest management (IPM)

Utilisation of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment.

3.4 pulp

Aril or fleshy portion of the fruit.

3.5 peduncle

Section adjoining the fruit to the stem-end.

3.6 digitally traceable

Capable of being tracked and verified through a secure digital system of the supply chain.

NOTE. Digital traceability may involve unique identifiers such as QR codes or encrypted digital signature, serial numbers to confirm origin, process history, certification status, and supply chain transparency.

3.7 paste

Fleshy portion in paste form that has been deseeded and without any added ingredients including water.

3.8 pulp

Pulped parts of raw fruit from which no juice has been extracted.

3.9 whole fruit

Fresh fruit that has not been deshelled and processed.

4. Requirements of *DSR Malaysia Durian Musang King*

4.1 Typical characteristics

DSR Malaysia Durian Musang King displays the distinctive characteristics of Musang King Durian as detailed in Annex C.

4.2 Minimum requirements

4.2.1 *DSR Malaysia Durian Musang King* shall be:

a) whole with intact peduncle;

b) fresh and clean;

c) practically free from visible defects (i.e. physiological and mechanical);

d) practically free from damage caused by pests;

e) free from damage caused by low and/or high temperatures;

f) free of any foreign smell and/or taste; and

g) when ripe, the following abnormal pulp is not allowed: hardened pulp, tip burn and wet core (water core).

4.2.2 Examples of defects and damage of Musang King Durian are as shown in Annex D.

4.2.3 *DSR Malaysia Durian Musang King* shall follow requirements stipulated in Clause 7 for harvesting.

4.2.4 The condition of *DSR Malaysia Durian Musang King* shall be such as to enable it:

a) to withstand transportation and handling; and

b) to arrive at its destination in a satisfactory condition.

4.2.5 The pesticide residue, heavy metals and microbial content of *DSR Malaysia Durian Musang King* shall not exceed the maximum limits specified in the *Food Act 1983* and *Food Regulations 1985* and, where applicable, the specific requirements of the importing country.

4.2.6 Prohibition of Basic Yellow 2 (BY2)

DSR Malaysia Durian Musang King shall be free from any traces of Basic Yellow 2 (BY2) / Auramine O. Compliance shall be verified using the test method specified in Annex E.

NOTE. Basic Yellow 2 (BY2) / Auramine O is toxic and prohibited for use in food products due to its carcinogenic properties and health risks.

4.2.7 Marketing and export of *DSR Malaysia Durian Musang King* shall comply with the *Federal Agricultural Marketing Authority Act 1965 [Act 141]* and *Federal Agricultural Authority (Grading, Packaging and Labelling of Agriculture Produce) Regulations 2008*.

4.3 Grading

4.3.1 *DSR Malaysia Durian Musang King* shall be graded according to the requirements specified in Table 1.

Table 1. Quality grades and requirements of DSR Malaysia Durian Musang King

Grade	Requirements	Tolerances (maximum)

Premium	– The fruit has superior quality with the characteristics of Musang King Durian. – The fruit is free from cracked husks, defects and/or damage that do not affect the general appearance of the produce, the internal quality, the keeping quality and presentation in the package. – The fruit shall carry a minimum of four developed locules.	- Damage shall not exceed 3 %. - 5 % by number or weight of the fruit not fulfilling the requirements of this grade, but meeting those of Grade 1.
1	– The fruit is of good quality with the characteristics of Musang King Durian. – The fruit shall carry a minimum of four developed locules. – Slight defects and/or damage, including cracked husks may be allowed provided that the defects and/or damage do not affect the general appearance of the produce, the internal quality, the keeping quality and presentation in the package.	– Damage not exceeding 5 %; – Defects not exceeding 5 %; and – 10 % by number or weight of the fruit not fulfilling the requirements of this grade, but meeting those of Grade 2.
2	– The fruits in this grade include those which do not qualify for higher grades, but fulfill the minimum requirements specified in clause 4.2.1. – The fruit shall carry a minimum of two developed locules. – Slight defects and/or damage, including cracked husks, may be allowed provided that the defects and/or damage do not affect the pulp.	– Damage not exceeding 5 %; – Defects not exceeding 10 %; and – 15 % by number or weight of the fruit fulfilling the requirements of this grade.
SOURCE. Modified from FS092: 2018, *Standard durian musang king D197* (*Durio zibethinus* L.)		

4.3.2 Premium grade of *DSR Malaysia Durian Musang King* shall be harvested from durian tree over 20 years old and cultivated in highland areas (above 180 m from sea level).

NOTE. Fruits harvested from older trees (20 years and above) tend to be of better quality compared to those from younger trees.

4.4 Sizing

The size of *DSR Malaysia Durian Musang King* shall be as specified in Table 2.

Table 2. Size of DSR Malaysia Durian Musang King

Size code		Weight per fruit (kg)
2	XL	> 2.5
3	L	1.6 to 2.5
4	M	1.1 to 1.5
5	S	0.5 to 1.0

NOTES.

1. This table is sourced and modified from MS 2431.
2. For all sizes, the size tolerance is 10 % by number or weight of fruit corresponding to the size immediately above and/or below that indicated on the package.
3. Size code 1 (XXL) is not applicable to Musang King Durian (medium variety).

5. *DSR Malaysia Durian Musang King* orchard requirements

5.1 Traceability

5.1.1 General

5.1.1.1 *DSR Malaysia Durian Musang King* shall be traceable to the tree from which it has been harvested through a properly established traceability system that enables the identification of product lots and their relation to batches of raw materials, processing and delivery records.

5.1.1.2 The traceability system shall be able to identify incoming material from the immediate suppliers and the initial distribution route of *DSR Malaysia Durian Musang King*.

5.1.1.3 Traceability records shall be maintained for a defined period for system assessment to enable the handling of potentially unsafe products and in the event of product recall. Records shall be in accordance with statutory and regulatory requirements and customer requirements and can be based on fruit lot identification.

5.1.2 Musang King Integrated Tracking System (MKITS®)

5.1.2.1 *DSR Malaysia Durian Musang King* shall be digitally traceable through the Musang King Integrated Tracking System (MKITS®). The system shall establish end-to-end traceability, enhance product authenticity, and support compliance with export requirements.

5.1.2.2 MKITS® labelling shall include, at minimum:

a) Orchard identification (ID) (e.g. altitude, location, MyGAP certification, age of the tree, etc.).

b) Harvest date.

c) Batch number.

d) Unique product identifier (e.g. QR code).

NOTE. MKITS® enables verification of origin, process history, certification status, and supply chain transparency.

5.2 Record keeping

Record keeping shall be transparent and allow easy retrieval of information to ensure traceability throughout the whole operation. The requirements for record keeping shall be as follows:

a) Records shall be kept up to date.

b) Records (e.g. purchasing, pesticides/herbicides application, etc.) documentation and accounts shall provide traceability and be made available to the inspector at any time for audit trail and trace-back verification.

c) All records shall be maintained for a period of not less than 7 years unless stipulated by any specific legislation.

d) Records shall be readily accessible.

e) All records shall be treated as confidential.

5.3 Transportation of whole fruit *DSR Malaysia Durian Musang King*

5.3.1 All vehicles used to transport *DSR Malaysia Durian Musang King* to packing house/processing facility/local consumer shall be suitable for the purpose, in good physical condition, dry (no dripping or standing water), well maintained and clean. All vehicles and containers shall be inspected for debris, soil and odour prior to loading.

5.3.2 The management shall implement measures to minimise risk of pest infestation and/or microbial contamination during transit.

5.3.3 *DSR Malaysia Durian Musang King* shall not be transported in vehicles that have been used to transport live animals, animal parts, soil or chemicals.

5.3.4 All transportation vehicles for *DSR Malaysia Durian Musang King* shall be inspected for pests prior to loading and transporting.

5.3.5 *DSR Malaysia Durian Musang King* shall be transported using vehicle with appropriate protective measures.

5.4 Personal hygiene

5.4.1 The requirement for hygiene procedures in accordance with the *Food Hygiene Regulations 2009* shall be adopted by all orchard workers.

5.4.2 Written instructions on hygiene practices shall be provided to orchard workers and displayed on prominent locations.

5.4.3 Orchard workers shall have access to clean toilets and washing facilities in the vicinity of their workplace.

5.4.4 Orchard workers shall immediately notify management if they contact any communicable disease or are otherwise unfit to perform tasks involving handling, storage, or processing of Musang King Durian and its downstream products.

5.5 Access control and biosecurity

5.5.1 The orchard management shall ensure effective farm biosecurity measures are in place to minimise the risk of unwanted plant, animal and microbiological organisms entering the orchard and causing problems.

NOTE. Good biosecurity and hygiene practices in place at the farm and orchard level minimise the risk of new pests from both entering the orchard and spreading undetected and unrestricted within the orchard.

5.5.2 Orchards should have secure external fencing with appropriate signage and gates, that should, in most instances, be kept closed.

5.5.3 The orchard management shall minimise the movement in and out of the orchard. All non-essential vehicles should be restricted from entering production areas.

5.5.4 Farm machinery including sprayers, chainsaws, etc. should be washed down prior to entry into the orchard if they have been used in other areas of lower biosecurity management.

5.5.5 Vehicles, machinery and equipment coming from another property should preferably be cleaned prior to leaving the previous property.

5.5.6 People entering the property, including staff, contractors, utility providers and visitors may bring contaminants from foreign countries, interstate and/or other properties.

5.5.7 The number of entry points to the property shall be limited, and adequate signage shall be provided to inform visitors of the biosecurity requirements upon entering the property.

5.5.8 Visitors' register and checklist shall be in place to ensure all relevant individuals are made aware of designated parking areas, wash down stations and wash down protocols, permitted areas and any off-limits areas.

5.5.9 Pest and disease control

5.5.9.1 The orchard management shall ensure proper selection of seedlings to prevent pest and disease infestation (refer clause 6.3). Records of the sourcing of all seedlings shall be maintained.

5.5.9.2 The management shall appoint relevant officers to conduct regular surveillance of the orchard and associated yards to identify trouble spots and potential sites of pest and disease infestation. Any pest and disease issues found within and nearby the orchard shall be recorded. The relevant authorities should be contacted for support in the event of detection of potential pest and disease infestation or other similar issues that are not readily identifiable.

5.5.9.3 The management shall ensure all workers are well trained for pest and disease identification and control.

5.5.9.4 Equipment, particularly pruning equipment, shall be disinfected at regular intervals to minimise the potential for spread of pests or diseases.

5.5.9.5 Personal protective equipment (PPE), wherever applicable, shall be cleaned after each use and stored separately from contaminants. Separate storage areas should be provided for clean and used PPE. Clean PPE shall be used in such a manner that the likelihood of cross-contamination is minimised.

5.6 Training of workers

5.6.1 All workers should be trained on the following subjects to ensure good understanding of the subjects and correct application of them in their daily tasks:

a) good agricultural practices, including pest and disease management;

b) good hygienic practices;

c) food safety;

d) food hygiene; and

e) safe working practices (e.g. accident prevention, emergency procedures, risk reduction and usage of personal protective equipment (PPE)).

NOTES.

1. Training on good hygienic practices is to ensure all workers are aware of their roles and responsibilities in protecting products from contamination and deterioration.

2. Information relating to safe working practices should be made available and displayed appropriately.

5.6.2 Workers shall be trained to perform the work correctly.

5.6.3 All workers should be briefed on the importance of biosecurity and of the on-farm hygiene practices in place. Staff induction should include the process of cleaning footwear and equipment on entering and exiting the property, and of any internal on-farm hygiene requirements.

5.6.4 Workers directly involved in the orchard and subsequent processing, where applicable, shall be in good health and receive basic training on hygiene requirements. Training records shall be maintained.

5.7 Workers' welfare

5.7.1 General

5.7.1.1 All employment requirements shall comply with national and local labour laws, and

where appropriate, relevant International Labor Organization (ILO) conventions.

5.7.1.2 Safe working conditions in the orchard shall be ensured at all times, in line with the *Occupational Safety and Health Act 1994* and relevant ILO conventions to ensure safe and healthy working conditions.

5.7.1.3 If basic amenities for on-site living are provided, it shall comply with national and local laws.

6. Agronomic practices

The following clauses describe the essential elements of Good Agricultural Practices (GAP) which the orchard shall adopt for the production of good quality *DSR Malaysia Durian Musang King* in a sustainable manner.

6.1 Site history and site management

6.1.1 The management shall demonstrate compliance with applicable legislations currently in force in Malaysia such as land title, licensing and operational approval requirements from the relevant authorities.

6.1.2 A risk assessment shall be carried out for new orchards to determine the suitability of the land for cultivation of *DSR Malaysia Durian Musang King* and the result shall be properly documented and maintained. The risk assessment shall, as a minimum, take the following factors into account:

a) prior use of the land;

b) potential impacts of the production on adjacent crops and areas; and

c) potential impact of activities carried out in adjacent areas.

6.1.3 Orchards should not be located more than 1 000 m above sea level unless the necessary regulatory approvals for such plantations have been granted.

6.1.4 Where orchards are located on sloping land (within the permissible level, i.e. 6º to 12º and foothills), appropriate soil conservation measures shall be undertaken to prevent soil erosion and silt deposition into drains, waterways, etc.

6.1.5 A visual identification or reference system, in form or map, etc. for each orchard shall be established and maintained.

6.1.6 The management shall closely monitor any changes on the orchard site that might affect the risk factors that were outlined in the risk assessment.

NOTE. The areas that are commonly monitored regularly include records of tests to determine contamination in water sources and records of tests of samples taken for detecting contamination in products.

6.2 Soil management

6.2.1 Soil and topography map of the orchard shall be available for planning and planting programmes.

6.2.2 Field management shall be done properly by means of cover cropping. Naturally occurring grass shall be maintained to form a protective vegetation cover on the soil surface, with highly branched roots to help conserve the soil against erosion. Grass trimming shall be done regularly to promote healthy growth.

6.3 Seedling requirement

6.3.1 The seedlings shall be sourced from reliable and reputable nursery(ies).

6.3.2 The seedlings shall be healthy, vigorous, free from pests and diseases, of excellent quality and with compatible species, variety or clone.

NOTE. It is recommended to mix Musang King variety with other varieties in the same orchard.

6.4 Fertiliser management

6.4.1 To ensure nutrient balance and minimise nutrient loss, proper soil and crop management practices should be adopted to suit the soil types. Best practices may be referred to *Pakej Teknologi Durian* by Department of Agriculture (DOA).

NOTE. A pH range of 5.5 to 6.5 is considered ideal for cultivation of durian. Higher pH will cause iron and zinc deficiencies.

6.4.2 Usage of fertilisers should be in accordance with science-based recommendations orestablished best practices.

6.4.3 The type, quantity, method, timing and frequency of fertiliser application should be carefully observed to maximise benefits and minimise losses.

NOTES.

1. Critical periods for fertilisation are after harvest, mid-vegetative growth, before flowering, during flowering and fruit set and two to four weeks after fruit development.

2. Fertiliser is best applied during the break of heavy rainfall.

6.4.4 During dry season, fertiliser should be applied with irrigation to facilitate absorption.

6.4.5 Appropriate application of organic fertiliser should be done to improve soil structure, aeration and water retention properties of the soil.

6.4.6 Application of suitable bio-fertilisers should also be done to increase fruit productivity.

6.4.7 All applications of fertilisers shall be recorded as required by MyGAP certification.

6.4.8 Fertiliser inventory shall be kept up-to-date and made available.

6.4.9 Fertilisers shall be stored on raised platforms in a covered, clean, dry and well-ventilated location where there is no risk of contamination of water sources. For organic

fertiliser, it should be stored in an appropriate manner to reduce the risk of contamination of the environment.

6.4.10 Any unfinished fertiliser shall be properly stored by tying the bag well and keeping it at room temperature to minimise moisture absorption.

6.5 Irrigation and drainage

6.5.1 The quality of water used for cultivation shall be maintained at suitable alkalinity and pH levels to ensure the healthy growth of the trees. The water quality shall be monitored and recorded throughout the cultivation.

6.5.2 Water used shall be obtained from non-polluting sources. It shall not be untreated wastewater from any activity that could cause contamination.

6.5.3 The management shall adopt an appropriate irrigation system to ensure sufficient water is provided for fruit development stages to achieve good quality yields.

6.5.4 During crop establishment (i.e. the first two years of cultivation), the young trees shall be irrigated once or twice a day, depending on the rainfall.

6.5.5 The drainage system for removal of excess runoff for management of root zone shall be well maintained.

6.6 Waste management

6.6.1 Waste management shall be in accordance with the requirements of Good Agricultural Practices (GAP) and relevant authorities.

6.6.2 All possible waste products and sources of pollution in the farm and its surrounding areas shall be identified.

6.6.3 Waste pit shall be available at the farm for disposal of agriculture waste away from crops.

6.6.4 Agriculture waste that is caused by infestation of pests and diseases shall be treated prior to disposal. Crop debris may be composted and recycled for soil conditioning.

6.6.5 Effective waste management shall be developed and implemented to avoid or reduce waste and pollution.

6.7 Pruning

6.7.1 Pruning shall be carried out regularly and effectively on the tree. Refer Annex F for best practices of pruning.

6.7.2 All records shall be retained.

6.8 Machinery and equipment

All machinery and equipment shall be kept in good working conditions. Any malfunctioning machinery components due to wear and tear/life span (based on manufacturer's recommendation) shall be repaired and/or replaced.

7. Integrated pest management (IPM)

7.1 The management shall seek advice from competent authorities on IPM and pesticide usage.

7.2 IPM should be implemented to discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment.

7.3 All pesticide applications, including fungicides and insecticides, shall comply with the provisions of the *Pesticides Act 1974* and any applicable requirements of the importing country. Only pesticides registered under the *Sistem Maklumat Racun Perosak* (SISMARP) shall be used.

7.4 The management shall take active measures to avoid the risk of pesticide drift from own plots to neighbouring production areas. This may include, but not limited to, knowledge of what the neighbours are growing, maintenance of spray equipment, etc.

7.5 All applications of pesticides shall be recorded as required by MyGAP certification.

7.6 Training and instructions on the usage of pesticides, including instructions on their safe handling and application, shall be provided to workers.

7.7 The management shall ensure that pesticides are used according to their intended purpose, application requirements, preparation, formal instructions, dosages and withholding periods.

7.8 Chemicals storage

7.8.1 All chemical compounds shall be stored in secure lockable store(s) and in accordance with manufacturers' instructions or as recommended by the competent authority and, where appropriate, be physically separated.

7.8.2 Manufacturer's Product Specification and Safety Data Sheets (SDS) for all chemical compounds shall be retained and be easily retrievable.

7.8.3 Storage structure(s) for pesticides, fertilisers and other agrochemicals shall not be located adjacent to water sources.

8. Harvesting requirements

8.1 Mature fruit shall be allowed to drop naturally. Appropriate method shall be used to assist proper harvesting, such as netting and/or securing the fruit peduncle with a rope to protect the fruit from falling to the ground.

8.2 Orchard workers shall be healthy and fit to work while collecting fruits. Any case of unhealthy worker shall be reported to the management to avoid introduction and contamination of human pathogens such as bacteria, viruses, and parasites to the fruits.

9. Post-harvest management

9.1 Cleaning

9.1.1 The harvested fruit shall be immediately cleaned to remove dirt and other foreign matters on the thorn and/or husk.

9.1.2 The fruit shall undergo dry cleaning process through appropriate method such as soft brush and compressed air blowing. The use of water for cleaning shall be avoided.

9.1.3 Cleaned fruits shall be properly segregated from the uncleaned ones to avoid cross contamination.

9.2 Sorting

9.2.1 The process shall be done to fulfil the following objectives.

a) Selecting good quality fruit that is free from defects and damage.

b) Sizing of fruit (refer the requirements described in Clause 4).

9.2.2 Workers shall be trained to perform sorting properly.

9.2.3 Defects and damage, as described in MS 2431 and Annex D, shall be properly identified. Affected fruit shall be segregated, labelled and disposed of properly.

9.3 Packaging and labelling

9.3.1 Packaging and labelling of fruit shall comply with the requirements of the relevant legislation currently enforced in Malaysia, i.e. *Food Regulations 1985* (Malaysia), *Federal Agricultural Marketing Authority Act* 1965 *[Act* 141*]* and *Federal Agricultural Marketing Authority (Grading, Packaging and Labelling of Agricultural Produce) Regulations 2008* and any additional requirements set by the importing country.

NOTE. Refer to Annex G for specific requirements for export of Musang King durian to China.

9.3.2 The fruit shall undergo packing process in a designated packing house.

9.3.3 The packaging used shall be made of suitable material of good quality, clean, practical and able to keep the freshness and quality of the product during handling and transporting.

9.3.4 Suitable packaging techniques and technology (e.g. vacuum-pack, shrink-wrap, etc.) to preserve and prolong the shelf life of fruit should be adopted.

9.3.5 Fruit for further processing shall be carefully loaded into designated containers with proper labelling.

9.3.6 Labelling

9.3.6.1 The management shall ensure that consumers can access important information about the fruit through written labels, QR codes, etc.

9.3.6.2 The following information, as applicable, shall be on the label:

a) name of the produce (i.e. Durian) and variety (i.e. Musang King Durian (D197));

b) nett weight (in kg);

c) class or grade;

d) size code and/or size;

e) name and address of grower/supplier/importer and/or exporter;

f) country of origin (applicable for export market);

g) "Produce of Malaysia" phrase for export market;

h) date of production or packaging;

i) date of harvest;

j) orchard identification/location; and

k) certification (MyGAP, etc.).

9.3.6.3 For export to China, the labelling requirements shall comply with clause 9.3.6 and other requirements described in Annex G.

10. Fresh pulp, frozen pulp and frozen paste of *DSR Malaysia Durian Musang King* requirements

10.1 General

10.1.1 The fruit shall be sourced from DSR orchards and shall comply with clause 5.1 for requirements on traceability and registered under *Sijil Pendaftaran Ladang* with Department of Agriculture (DOA).

10.1.2 The fruit shall be grown in accordance with Clause 6.

10.1.3 The fruit shall be of good quality and comply with the requirements specified in Clause 4.

10.1.4 The products shall comply with the provisions of this standard, MS *1514* and *Food Hygiene Regulations 2009*.

10.1.5 The products shall be manufactured in a facility that is certified to *FSSC 22000* and *MS 1480.*

10.1.6 The products shall also comply with Halal and *toyyiban* requirements in accordance with *MS 1500*.

10.1.7 Durian pulp intended to be sold as frozen pulp or paste shall be extracted in a processing room, with temperature maintained at or below 16 ºC.

10.2 Quality requirements

10.2.1 Fresh pulp and frozen pulp shall be made of raw *DSR Malaysia Durian Musang King* pulp from which no seed has been extracted.

10.2.2 Frozen paste shall be sourced from *DSR Malaysia Durian Musang King* pulp from which the seed has been extracted (deseeding) and shall contain not less than 25 % w/w of total solids as specified in *Food Regulations 1985* (refer Annex H for method to determine total solids).

10.2.3 The products shall have basic odour, flavour (bitterness) and colour corresponding to the characteristics of *Malaysia Durian Musang King*.

10.2.4 The products shall not contain any preservatives, food conditioners and/or colouring substances.

10.2.5 The products shall be free from extraneous matters.

10.2.6 The products shall be free from any objectionable flavours or odours.

10.2.7 The frozen products (i.e. frozen pulp and frozen paste) shall be stored under -18 ºC.

10.2.8 The products shall comply with the requirements given in Tables 3, 4 and 5 and any other requirements stipulated under the *Food Act 1983* and *Food Regulations 1985* currently enforced in Malaysia and/or by the importing country.

Table 3. Quality requirements for fresh pulp, frozen pulp and frozen paste of *DSR Malaysia Durian Musang King*

Physicochemical property	Quality requirement	Test method
Colour	*RHS code 11A	Colour Chart Guide, Royal Horticulture Society (RHS)

Total soluble solids (°Brix)	> 34	Annex I
* The colour determination is based on Teknologi Durian MARDI, 2022.		

Table 4. Maximum permitted levels of microbial contaminants for fresh pulp, frozen pulp and frozen paste of *DSR Malaysia Durian Musang King*

Microbial property	Maximum permitted level
Total plate count (cfu/g)	$< 10^5$
Escherichia coli (cfu/g)	Not detected
Staphylococcus aureus (cfu/g)	Not detected
Salmonella (cfu/25 g)	Absent
Listeria monocytogenes	Not detected

Table 5. Maximum permitted levels of metal contaminants for fresh pulp, frozen pulp and frozen paste of *DSR Malaysia Durian Musang King*

Metal contaminant	Maximum permitted level
Arsenic	1 mg/kg
Lead	2 mg/kg
Mercury	0.05 mg/kg
Cadmium	1 mg/kg
Antimony	1 mg/kg
SOURCE. *Food Regulations 1985*	

10.3 Packaging and labelling

10.3.1 The products shall be packed in new, clean and suitable food grade packaging materials.

10.3.2 Each individual pack shall be marked and contain the following information, as applicable:

a) type of product, i.e. “fresh pulp of Musang King Durian”, “frozen pulp of Musang King Durian” or “frozen paste of Musang King Durian”;

b) brand name or trade name;

c) nett weight;

d) lot identification;

e) name and address of the manufacturer and/or packer, or distributor;

f) the phrase “Product of Malaysia”;

g) date of manufacture;

h) best before;

i) nutritional values;

j) orchard identification/location; and

k) certification (HACCP, GMP, Halal, etc.).

10.4 Transport and distribution

10.4.1 The product temperature during transport and distribution should be maintained at -18 °C or below.

10.4.2 Distribution of the products shall be carried out in such a way that any increase in temperature does not affect the safety and quality of the products.

Annex A
(informative)

DSR Safety Originality Quality (SOQ) Framework

A.1 The DSR SOQ Framework establishes the foundational principles for ensuring the integrity and excellence of *DSR Malaysia Durian Musang King* products. It is built on three core pillars:

a) Safety: Compliance with food safety standards and regulatory requirements.

b) Originality: Assurance of authentic *DSR Malaysia Durian Musang King* origin and protection against misrepresentation.

c) Quality: Adherence to stringent quality standards for consistency and consumer trust.

A.2 To operationalise these principles, the SOQ Framework integrates digital traceability through the DSR Musang King Integrated Tracking System (MKITS®), enabling end-to-end verification across the supply chain.

A.3 The framework is also aligned with internationally recognised standards, including FSSC 22000 and HACCP, to ensure robust food safety and quality management throughout the supply chain.

A.4 Within this framework, Original Indication (OI) serves as an internal authenticity declaration for products that meet all SOQ requirements. The OI declaration confirms that the products contain or are made of genuine *DSR Malaysia Durian Musang King* origin, produced under certified systems, and compliant with both domestic and international standards for safety, quality, and traceability.

A.5 Figure 1 illustrates the SOQ Framework, highlighting its core principles, supporting standards, and the integration of MKITS® for digital traceability.

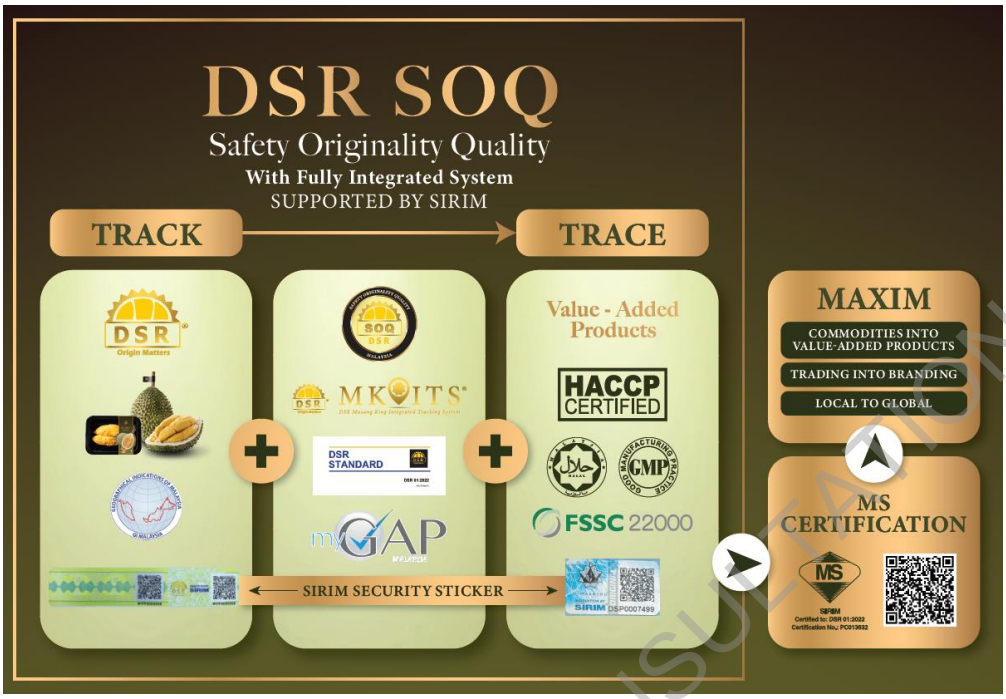
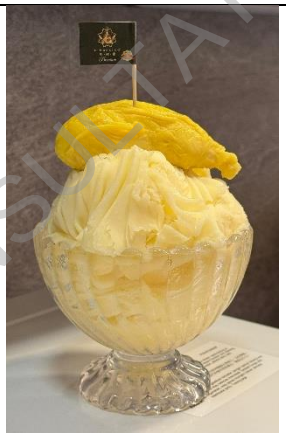
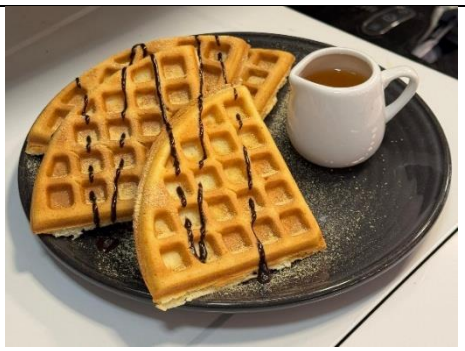
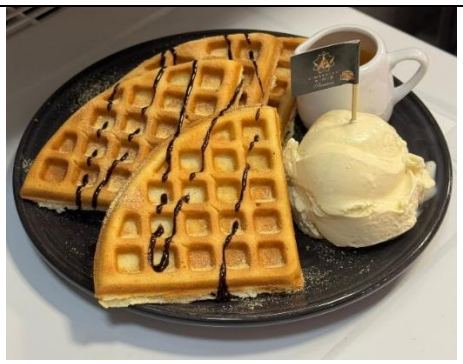


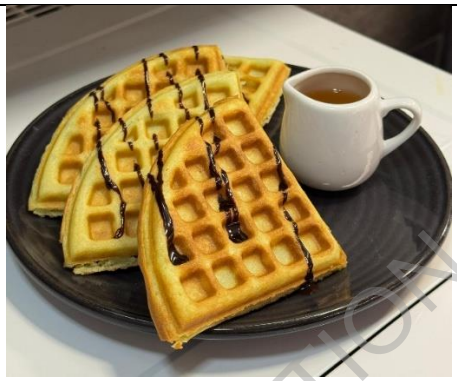
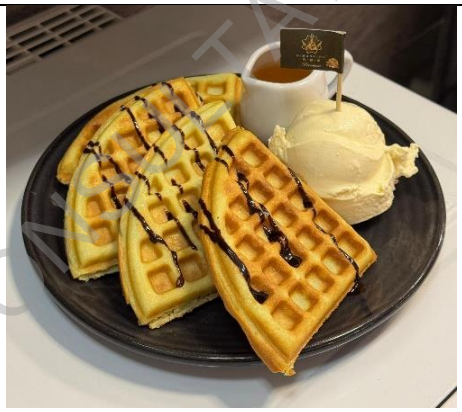
Figure A.1 DSR Safety, Originality and Quality (SOQ) Framework Overview

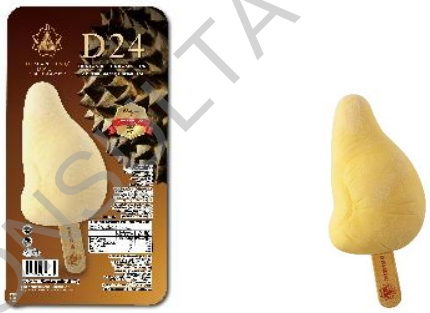
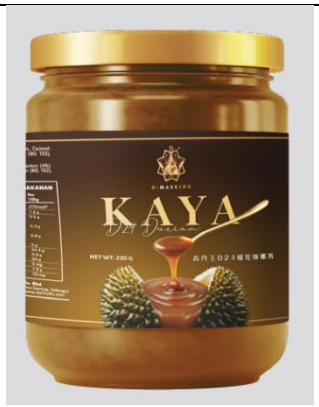
Annex B
(informative)

DSR Products Portfolio

No.	Product name	Production start year	Product image
1.	a) Durian ice cream filled croissant	2021	
2.	a) Musang King Gelato Capsule 90g	2021	
	b) Musang King Gelato 140ml	2021	

No.	Product name	Production start year	Product image
	c) Icekeimo Classic	2023	
	d) Icekimo Durian	2023	
	e) Durian Waffle	2023	
	f) Durian Waffle with Durian Gelato	2023	

No.	Product name	Production start year	Product image
	g) Coconut Pandan Waffle	2023	
	h) Coconut Pandan Waffle with Durian Gelato	2023	
	i) Musang King Durian Ice Cream Stick	2024	 
	j) D24 Gelato Capsule 90g	2024	 

No.	Product name	Production start year	Product image
	k) D24 Gelato 140ml	2025	
	l) D24 Durian Ice Cream Stick	2025	
	m) D24 Durian Kaya	2025	

Annex C
(informative)

Typical characteristics of *DSR Malaysia Durian Musang King*

C.1 General characteristics of Malaysia Durian Musang King (D197)

C.1.1 The fruit is obovate in longitudinal view; slightly rounded with shallow grooves in cross-section; apex rounded; segment lines are clear and prominent; ridges along the segments lined with spines; average length is medium at 20 cm; average width is medium at 15.5 cm; average fruit size is medium at 1.8 kg; average rind thickness is 1.7 cm; and average stalk length is medium at 5.4 cm.

C.1.2 The spines are acute in shape; fine spines at the tip area are broad and positioned upright.

C.1.3 The flesh is thick; primary colour is yellow; aroma is mild; sweetness is strong; slight bitterness; texture is moderate; seed shape is elliptical; seed size is medium; and the presence of flat seeds is abundant.

SOURCE. Translated from Register of Common Crop Varieties, Plant Variety Protection Malaysia, Department of Agriculture (DOA).

C.2 Typical characteristics of Malaysia Durian Musang King (D197) produced by DSR

The Malaysia Durian Musang King produced by DSR displays the distinctive characteristics as shown in the figures below.

Figure C.1 *DSR Malaysia Durian Musang King*

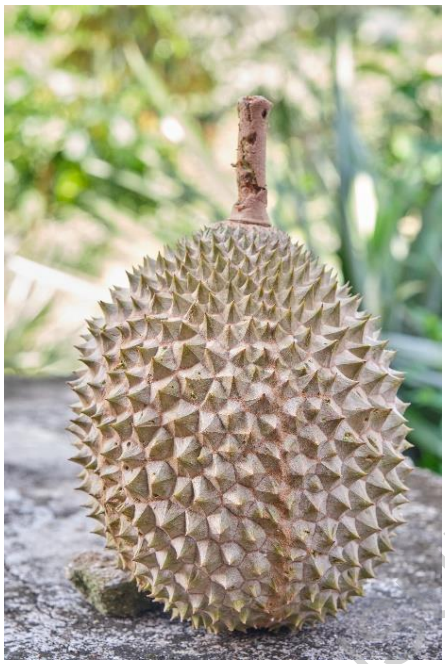


Figure C.2 Brownish green husk colour of highland *DSR Malaysia Durian Musang King*

Figure C.3 Wrinkled and aged husk of *DSR Malaysia Durian Musang King* from tree over 20 years old

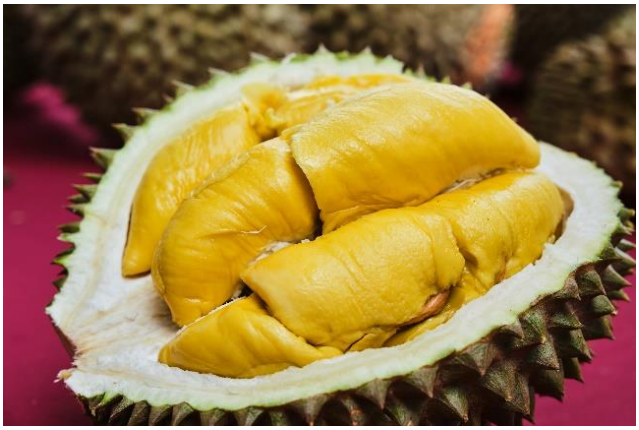


Figure C.4 Flesh of *DSR Malaysia Durian Musang King*

Figure C.5 Starfish shape on *DSR Malaysia Durian Musang King*

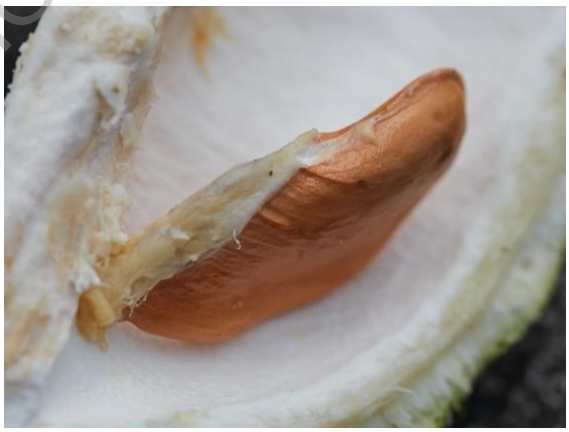


Figure C.6 Seed of *DSR Malaysia Durian Musang King*

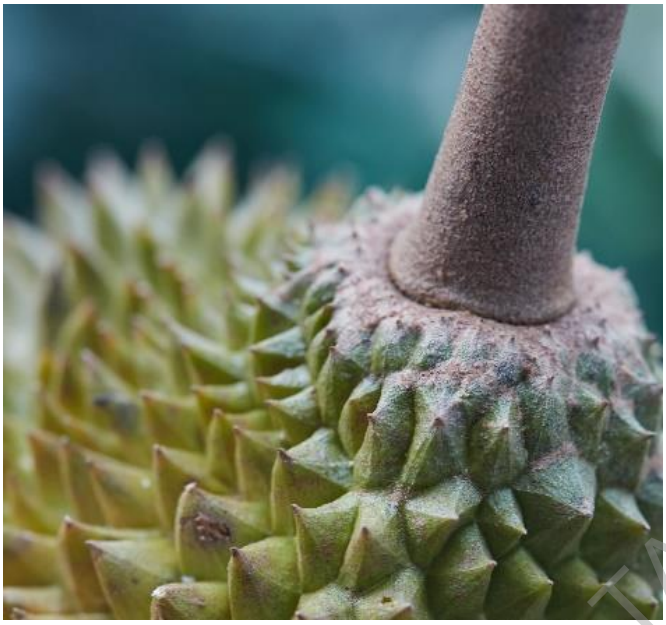
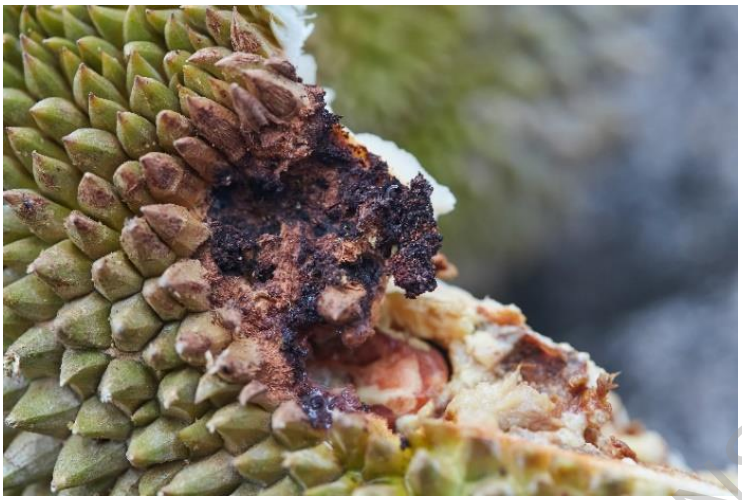


Figure C.7 Circle at the base of the peduncle of *DSR Malaysia Durian Musang King*

Annex D
(informative)

Examples of defects and damage of Musang King Durian



Annex E
(normative)

Determination of Basic Yellow 2 (BY2) / Auramine O in Durian by UHPLC-MS/MS

E.1 Purpose

This procedure describes the method for determination and quantification of Basic Yellow 2 (BY2) / Auramine O using UHPLC-MS/MS in durian pulp and paste.

E.2 Scope

Durian pulp and paste.

E.3 References

E.3.1 Auramine O in Food Products: Improved g) QuEChERS extraction coupled with UHPLC-MSMS Quantitation ACTA CHEMICAL IASI, 32_2, 183-206 (2024). DOI: 1047743/achi-2024-2-0011 (With Modification)

E.4 Definitions

Nil

E.5 Detailed procedures

E.5.1 Reagents/Chemicals

a) Ultrapure water, with specific conductivity of 18.0 MΩ.

b) Auramine O, pure, biological stain, 80 %.

c) Methanol ≥ 99.9 %.

d) Magnesium sulphate.

e) Ammonium formate.

f) Formic acid, ≥ 98 %.

g) QuEChERS Dispersive Solid Phase Extraction (dSPE) Kits for Fruits and Vegetables with Fats and Waxes

h) Acetonitrile, ≥ 99.9 %.

i) Sodium chloride, ≥ 99.99 %.

E.5.2 Equipment/Apparatus/Materials

a) **High Performance Liquid Chromatography (UHPLC),** attached with Mass Spectrometry (MS/MS).

b) **HPLC column,** accucore C_{18} Column (50 mm x 2.1 mm, i.d. 2.6 µm).

c) **Analytical balance,** with sensitivity of 0.0001 g.

d) **Centrifuge**

e) **Vortex shaker**

f) **Polytetrafluoroethylene (PTFE) filter,** 0.22 µm filters.

g) **Glassware,** 50 mL and 10 mL volumetric flasks (VF).

h) **Multifunction tube rotator**

E.5.3 Test procedures

E.5.3.1 Preparation of reference standard

E.5.3.1.1 Stock solution, 1 000 ppm

a) Weigh approximately 10 mg of Auramine O standard using the analytical balance.

b) Transfer the standard to a 10 mL volumetric flask.

c) Dissolve and dilute to volume with methanol to achieve a concentration of 1 000 ppm.

d) Store at -20 °C (Stable for 12 months).

e) Prepare lower concentrations by serial dilution of stock.

E.5.3.1.2 Preparation of calibration standard in matrix (Proposed only)

Level	ppm
CC1	3.000
CC2	2.000
CC3	1.500
CC4	1.250
CC5	0.625
CC6	0.500
CC7	0.375
CC8	0.313
CC9	0.188
CC10	0.156
CC11	0.078
QCH	2.500
QCM	1.000
QCL	0.250

E.5.3.1.3 Preparation of sample

a) Accurately weigh 10 g of homogenised sample into a 50 mL centrifuge tube.

b) Add 10 mL Ultrapure water, vortex and shake for 5 min using multifunction tube rotator.

c) Add 10 mL acetonitrile, vortex and shake for 5 min.

d) Add 4 g $MgSO_4$ + 1 g NaCl, and shake for 5 min.

e) Centrifuge the mixture for 10 minutes at 3 500 rpm.

f) Collect the supernatant and transfer 1 mL of supernatant into tube with 0.4 g of QuEChERS Dispersive Solid Phase Extraction (dSPE) which consists of PSA, C18 and magnesium sulphate.

g) Centrifuge the mixture for 10 min at 3 500 rpm.

h) Filter supernatant through a 0.22 µm PTFE membrane filter before transferring it to vials.

E.5.3.1.4 HPLC conditions

a) Positive ionisation (H-ESI(+)).

b) Mobile phase:

i) Solvent A: Methanol (5mM NH4HCOO, 0.1 %FA).

ii) Solvent B: H2O (5mM NH4HCOO, 0.1 %FA).

c) Gradient program:

Time	% (A)	% (B)
0.0	20	80
1.0	20	80
2.0	100	0
4.0	100	0
4.1	20	80
6.0	20	80

d) Flow rate: 0.3 mL/min.

e) Temperature: 40 ºC.

f) Injection volume: 10 µL.

E.5.3.1.5 Ion identification

a) Prepare 10 ppb AO Standard; inject directly into MS.

b) MS Scan mode: Positive scan, m/z 100 - 300.

c) Identify parent ion: m/z 268.18100.

d) Identify daughter ion: m/z 122.09670, 147.09187, 252.14961.

e) Quantitation, which is based on m/z 147.09187 in Item d).

Annex F
(informative)

Best practices for pruning of DSR Malaysia Durian Musang King tree

F.1 Musang King Durian tree needs to be properly pruned on a regular basis to develop a strong tree structure, healthy and vigorous with a canopy shape, that encourages early flowering and good yield.

F.2 Pruning is carried out on water shoots before fertiliser application, on branches after fruit formation, and immediately after harvest to remove dried or diseased branches.

F.3 Pruning on young trees aims to remove certain parts of the tree as below:

a) New shoots that appear on the stock plant below grafting point.

b) Lower branches up to about 70 cm.

c) All branches that grow vertically.

d) All water shoots and unhealthy branches.

F.4 Pruning on matured and/or fruiting trees aims to remove certain parts of the tree as below:

a) Water shoots and suckers that grow into the canopy.

b) Branches that have borne too many fruits and become weak.

Annex G
(normative)

Export requirements of Musang King Durian to China

G.1 Export of whole fruit

G.1.1 Musang King Durian to be exported as whole fruit shall be sourced from orchards registered with the DOA under the *Pendaftaran Ladang Eksport* programme.

G.1.2 Requirements for packing houses handling Musang King Durian shall comply with the *Garis Panduan Kawalan Keselamatan Makanan di Peringkat Rantaian: Gudang dan Pusat Pengumpulan* issued by the Ministry of Health Malaysia (MOH).

G.1.2.2 The packing house shall be certified under an appropriate food safety management programme, such as MeSTI (*Makanan Selamat Tanggungjawab Industri*), GMP (Good Manufacturing Practices), HACCP (Hazard Analysis and Critical Control Points), etc., issued by MOH and/or an accredited certification body.

G.1.2.3 The packing house shall be registered with the DOA under the *Pendaftaran Ladang Eksport* programme.

G.1.2.4 Table G.1 summarises the general export requirements for whole fruit of Musang King Durian to China.

Table G.1 Summary of export requirements to China

Requirement area	Details
Farm and facility registration	a) Fruits shall be sourced from farms registered with DOA Malaysia and approved by General Administration of Custom of the People's Republic of China (GACC). b) Processing facilities shall also be registered with DOA and approved by GACC.
Phytosanitary compliance	a) A phytosanitary certificate issued by DOA is required. b) Fruits shall be free from quarantine pests of concern to China.
Pesticide residue and food safety	a) Compliance with China National Food Safety Standard (e.g. MRLs for pesticides, contaminants/heavy metals) is mandatory. b) Pre-export residue testing is recommended.
Packaging and labelling	a) Packaging shall be durable, ventilated, and suitable for long-distance transport. b) Labels shall be in Chinese with/without English. c) Traceability shall be maintained from farm to consignee.
Export documentation and registration	a) Export license from MPIB. b) Approval permit from MPIB. c) Required documents are Phytosanitary Certificate, invoice, packing list, Custom K2 Form, Bill of Lading or Airway Bill and Certificate of Origin. d) Export permit from MAQIS. e) Exporter shall be registered under Registration of Imported Food. Exporters and Agents System.
Certifications	a) Malaysia Good Agricultural Practice (MyGAP) Certification is required. b) GLOBALG.A.P., GMP and HACCP are recommended.

G.2 Export of fresh pulp, frozen pulp and frozen paste

G.2.2.1 DSR Malaysia Durian Musang King in the forms of fresh pulp, frozen pulp and frozen paste to be exported to China shall comply with General Administration of Custom of the People's Republic of China (GACC) requirements given in Tables 7 and 8 stipulated under *GB 2762, Maximum Limit for Contaminant in Food* and *GB 29921, Maximum Limits for Pathogenic Microorganism in Food*.

Table G.2 Maximum permitted levels of heavy metals for fresh pulp, frozen pulp and frozen paste of Musang King Durian to be exported to China

Heavy metal	Maximum permitted level (mg/kg)	
	Fresh and frozen pulp	Frozen paste
Plumbum	≤0.1	≤0.4
Cadmium	≤0.05	≤0.05
SOURCE. *GB 2762, Maximum Limit for Contaminant in Food*		

Table G.3 Maximum permitted levels of microbial contaminants for fresh pulp, frozen pulp and frozen paste of Musang King Durian to be exported to China

No	Bacteria	Sampling plan and limit (/25 g or/25 mL, unless specified)			
		n	c	m	M
1	*Salmonella spp.*	5	0	0	-
2	*Staphylococcus aureus*	5	1	100 CFU/g	1 000 CFU/g

SOURCE. *GB 29921, Maximum Limits for Pathogenic Microorganism in Food*

NOTES.
1. n (Number of Samples): The total number of food units tested from a batch.
2. m (Minimum Limit): The microbial count considered good or acceptable.
3. M (Maximum Limit): A level indicating the food is unacceptable or poses a potential health hazard if exceeded.
4. c (Number of Defects): The maximum number of samples allowed to have microbial counts between 'm' and 'M' (marginally acceptable).

G.2.2.2 *DSR Malaysia Durian Musang King* in the forms of fresh pulp, frozen pulp and frozen paste to be exported to China shall comply with the labelling requirements specified in clause 9.4 and below additional requirements:

a) place and state of production;

b) name and address of exporter;

c) date of packaging; and/or

d) date of minimum durability.

Annex H
(normative)

Determination of total solids

H.1 General

The total solids are determined by measuring the mass of water in a known mass of sample of a food before and after the water is removed by evaporation.

H.2 Apparatus

Convection and forced draft ovens.

H.3 Procedure

H.3.1 Weigh sample and label as initial weight.

H.3.2 Put the sample on a tray and spread evenly.

H.3.3 Place in an oven for a specified time and temperature (e.g. 3 hours at 100 ºC).

H.3.4 Weigh the dried sample and label as dried weight.

H.3.5 Calculate as below.

$$\text{Total solids}, \% = \frac{\text{Dried weight}}{\text{Initial weight}} x\ 100\ \%$$

Annex I
(normative)

Determination of total soluble solids

I.1 General

The total soluble solids are determined by using hand refractometer. Measurements are carried out at sample temperature of 20 °C.

I.2 Apparatus

Hand refractometer.

I.3 Procedure

I.3.1 Clean the refractometer before use.

I.3.2 Place one or two drops of sample on the prism.

I.3.3 Close the daylight plate gently and ensure the sample is spread all over the prism surface.

I.3.4 View the scale through the eyepiece.

I.3.5 Read the scale where the boundary line intercepts it.

I.3.6 Clean the prism after use.

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