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Royal jelly production

Production de gelée royale

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Production conditions	1
4.1 Environmental requirements.....	1
4.2 Production site.....	2
4.3 Production staff.....	2
4.4 Bee colony.....	2
4.5 Bee nutrition.....	3
4.6 Apicultural equipment.....	3
5 Production process management	4
5.1 Management of royal jelly production.....	4
5.1.1 Organization of bee colonies.....	4
5.1.2 Management of royal jelly producing colonies.....	4
5.1.3 When to stop using bee colonies for royal jelly production.....	4
5.2 Production processes.....	5
5.2.1 Sanitation of producing area.....	5
5.2.2 Cleaning and disinfection of beekeeping equipment and staff.....	5
5.2.3 Larvae donor-comb cultivation.....	5
5.2.4 Installation of the queen cell cup bar.....	5
5.2.5 Familiarizing and cleaning the queen cell cups.....	5
5.2.6 Larvae grafting.....	5
5.2.7 Inserting the royal jelly frame.....	5
5.2.8 Removing the royal jelly frame.....	5
5.2.9 Transporting the royal jelly.....	6
5.2.10 Cutting the queen cell cups.....	6
5.2.11 Removing larvae from queen cells.....	6
5.2.12 Extracting the royal jelly.....	6
5.2.13 Labelling the containers.....	6
5.2.14 Cleaning queen cell cups and bar.....	6
5.2.15 Packaging.....	6
5.3 Record and file management.....	6
5.4 Mark and traceability.....	7
6 Storage and transportation	7
Annex A (informative) Example of a beekeeping production log and a delivery note	8

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee TC 34, *Food products*, Subcommittee SC 19, *Bee products*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Royal jelly production

1 Scope

This document specifies the production of royal jelly, including production conditions, production process management, storage and transportation requirements of royal jelly.

This document is applicable to the production of royal jelly.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12824:2016, *Royal jelly — Specifications*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

royal jelly

mixture of secretions from hypopharyngeal and mandibular glands of worker bees, free from any additive

Note 1 to entry: It is the food of larval and adult queens. It is a raw and natural food, unprocessed except for filtration which does not undergo addition of substances. The colour, the taste and the chemical composition of royal jelly are determined by absorption and transformation by the bees fed with the following two types of foods during the royal jelly production time:

- type 1: only bee's natural foods (pollen, nectar and honey);
- type 2: bee's natural food and other nutrients (proteins, carbohydrates, etc.).

[SOURCE: ISO 12824:2016, 3.1]

3.2

royal jelly production

activity of inducing honey bees in strong colonies to secrete *royal jelly* (3.1) into queen cell cups and then the royal jelly is harvested

4 Production conditions

4.1 Environmental requirements

4.1.1 In the foraging area of the apiary, diversified sources of pollen and nectar are recommended during the production period of royal jelly.

4.1.2 The apiary should be located at a site to satisfy the bee colonies' healthy life and rapid reproduction. Inside the working place, the daily temperature should be between 15 °C and 30 °C and moisture should be between 60 % and 80 % to produce royal jelly.

4.1.3 The apiary should have clean and unpolluted drinking water.

4.1.4 Sources of pollution in the foraging area of the apiary shall be very limited, and in any case shall not be detrimental to the health of bees and royal jelly production. There should be no food factories with honey and sugar as raw materials for production, chemical industry areas, mining areas, pesticide factory warehouses and garbage treatment plants within 5 km. If there are animal farms around, beekeepers shall be very careful to prevent residues from animals getting into the honey bee colonies, royal jelly harvesting room and royal jelly.

4.2 Production site

4.2.1 During production, a specific room or tent, or a specific area in a room or tent (protected from sources of contaminants) should be dedicated to produce royal jelly exclusively.

This room or tent shall be adapted for working with food products. A source of drinkable water for cleaning purpose should be available. A cold source capable of maintaining the harvested royal jelly at the temperature in accordance with ISO 12824:2016 shall be present in or near the room or tent used for harvesting and packaging the royal jelly.

Keep the apiary clean and hygienic. Regularly disinfect the bee hives and beekeeping equipment in direct contact with royal jelly and eliminate the old combs.

4.2.2 The beekeeper shall be extremely vigilant about the health of the colonies. The beekeeper shall not use any treatment or feed that can induce a risk of residue in royal jelly during the period of production. Antibiotics and persistent pesticides shall not be used at any time.

4.2.3 The sick colony should be treated with appropriate treatment (refer to [4.2.2](#)) or burnt and buried, and they should not be engaged in royal jelly production in the same year. The suspected sick colony should also be isolated, and it should be confirmed healthy before returning to the royal jelly production.

4.3 Production staff

4.3.1 Basic knowledge of beekeeping and basic skills in royal jelly production is recommended.

4.3.2 Production personnel shall regularly receive training on bee product food safety and standardized production technology. They shall regulate royal jelly production in accordance with the quality requirements in ISO 12824:2016.

4.3.3 It is recommended that the production personnel are healthy when they are involved in handling the royal jelly.

4.4 Bee colony

The beekeeper should ensure that the royal jelly producing colony is healthy and strong. The mass of the adult worker bees should be enough (minimum 2 kg of bees) to produce royal jelly, and should be the equivalent of a minimum of eight fully-covered of bees Langstroth frames.

4.5 Bee nutrition

During the royal jelly production period, bees can be fed with the food described in ISO 12824:2016 for royal jelly.

4.6 Apicultural equipment

4.6.1 Bee hives.

The material making up the hives shall be from wood or food-grade material. The following may be used:

- hot soaking in paraffin wax;
- thermo-paint on the outside of hives;
- linseed oil;
- non-toxic paints and varnishes.

The beekeeper should not remove propolis from the bee hive when producing royal jelly to prevent the proliferation of any microbial contaminant and to increase the colonies' immune system.

4.6.2 Royal jelly production frame, which should be made of wood, bamboo or food-grade plastic material.

4.6.3 Queen cell cups and bar holding queen cell cups.

Queen cell cups should be made of food-grade plastic or beeswax. The bars holding the queen cell cups should be made of wood, bamboo or food-grade plastic. The diameter of the queen cell cup can be 9 mm to 11 mm, and the depth can be 9 mm to 11 mm.

4.6.4 Larvae transfer tool, which can be made of horns, hair, stainless steel or food-grade plastic.

4.6.5 Royal jelly harvesting device, which shall be made of food-grade material.

4.6.6 Queen excluder, which should be made of wood, bamboo or food-grade material.

4.6.7 Beeswax.

Beeswax used in royal jelly production shall come from a provider who does not use any of the following products:

- persistent pesticides that can contaminate the royal jelly (e.g. coumaphos);
- chemical repellents;
- paradichlorobenzene;
- antibiotics.

It is recommended to use organic beeswax or to analyse it before use. Wax that has been treated with products that change its composition shall not be used.

4.6.8 Fridge and/or freezer in the bee yard, which shall be clean and disinfected and used only for storing royal jelly after the extraction.

4.6.9 Other utensils.

All tools in contact with royal jelly (extraction and packaging equipment) shall be of food-grade standard, and shall be easy to maintain, clean and disinfect.

5 Production process management

5.1 Management of royal jelly production

5.1.1 Organization of bee colonies

5.1.1.1 One to three days before royal jelly production, the bee colonies should be divided into a queenright brood rearing compartment and a queenless production compartment by using a queen excluder or by dividing the colonies.

5.1.1.2 Empty comb, sealed comb and honey pollen comb should be installed in the brood rearing compartment. The older larvae's (four to five days) comb should optimally be installed near the royal jelly production frame in the production compartment. The bee strength of queenright/queenless royal jelly-producing colonies should be maintained at a minimum of eight fully covered Langstroth frames.

5.1.2 Management of royal jelly producing colonies

5.1.2.1 Early management

If the number of bees is insufficient in the royal jelly producing colonies, the number of queen cell cups should match the bee intensity.

5.1.2.2 Daily management

5.1.2.2.1 Check the bee colonies regularly. When checking, the combs should be adjusted in time; the larvae comb and the capped brood comb in the rearing compartment should be transferred to the royal jelly production compartment, and then the empty comb in the royal jelly production compartment should be moved to the brood rearing compartment.

5.1.2.2.2 Removal of natural queen cells from the colony shall be practised weekly.

5.1.2.2.3 When the number of bees is insufficient, the empty combs should be removed in time to keep the worker bees dense.

5.1.2.2.4 When the weather is hot and dry, protect the colonies from the sun and feed clean and unpolluted drinking water to the bee colonies regularly.

5.1.3 When to stop using bee colonies for royal jelly production

Production of royal jelly should be stopped in the following cases:

- a) when no source of nectar and pollen is available, or no nectar and pollen are replenished in time;
- b) when there are pests, diseases or other serious enemies;
- c) when bees are poisoned by pesticides;
- d) when breeding conditions are not fulfilled in the bee hive.

5.2 Production processes

5.2.1 Sanitation of producing area

The larvae transfer and royal jelly extraction shall take place in a room equipped with a washable and clean table or benchtop. Clean and disinfect the table with more than 50 % ethyl alcohol or zeolite or other food-grade disinfectant products before operation. The prescribed contact time shall be respected during the disinfection.

5.2.2 Cleaning and disinfection of beekeeping equipment and staff

Materials that come into direct contact with royal jelly should be cleaned and disinfected with more than 50 % ethyl alcohol or zeolite or other food-grade disinfectant products. All cleaning and disinfecting products shall be certified for food production. Production staff should wear masks, clean overalls and work caps, and disinfect hands with more than 50 % ethyl alcohol or zeolite or other food-grade disinfectant products. The prescribed contact time shall be respected during the disinfection.

5.2.3 Larvae donor-comb cultivation

Restrict the queen at least in three spanning compartments with honey bee bread comb, empty comb and larvae comb by using a frame type vertical queen excluder. Induce the queen on the empty comb and let her lay eggs for 24 h. Record the date of the egg comb and larval hatch in the breeding colonies. When removing the egg comb for larval grafting into the royal jelly frame, an alternate egg comb should be provided in the former place.

5.2.4 Installation of the queen cell cup bar

Fix the queen cell cups bar on the royal jelly producing frame.

5.2.5 Familiarizing and cleaning the queen cell cups

Insert the royal-jelly-producing frame into the royal jelly production colonies and let the bees clean the queen cell cups for at least 12 h before using the frame to produce royal jelly for the first time.

5.2.6 Larvae grafting

The one-day-old larvae shall be removed from the worker cells by a grafting tool and each larva shall be placed lightly on the base of each queen cell cup. The royal jelly frame, during its transfer, should be covered with a moist, clean towel. When the queen cell cups are primed with royal jelly, this royal jelly shall come from the same farm or a farm that conforms to this document to avoid the risk of contamination. Dilution water, when used for the priming solution, shall be drinkable. The priming solution should be stored in a refrigerator. Alternatively, use another equipment or technique where this step is not necessary.

5.2.7 Inserting the royal jelly frame

The prepared royal jelly frame with larval grafts should be inserted between the larvae combs in the royal jelly production compartment.

5.2.8 Removing the royal jelly frame

Ideally after 48 h to 72 h of the larvae transfer, the royal jelly frame should be taken out from the colonies. When opening the beehive, smoke with non-polluting fuels or spray water with organic essential oil. Shake off the honey bees while keeping the queen cell cups' opening parts upward. The only techniques that shall be accepted are shaking off bees and/or mechanical methods.

5.2.9 Transporting the royal jelly

The transport of royal jelly filled queen cell cups shall be done in clean disinfected food-grade boxes or plates covered with a wet, clean, disinfected tissue or towel that can keep the humidity of the queen cells.

5.2.10 Cutting the queen cell cups

Cut the beeswax portion of the queen cell cups by using a clean, disinfected and food-grade blade in a room or a tent. The beeswax portion of the queen cells above the level of royal jelly shall be cut very carefully to avoid cutting the queen larvae.

5.2.11 Removing larvae from queen cells

The larvae shall be removed from the queen cells before the harvesting of royal jelly. If used for food, put the queen larvae in a clean, disinfected container, separate from the royal jelly container, and store the container with the larvae in the freezer within a maximum of 1 h after it is harvested. Royal jelly shall not be extracted from queen cells in which the larva is injured, dead or absent.

5.2.12 Extracting the royal jelly

Extract the royal jelly from the queen cell cups by using a royal jelly collecting device. The harvest shall be carried out on the same day and as soon as possible after the queen cells are removed from the hive. The royal jelly in a closed dark container shall be transported and stored within 30 min and up to a maximum of 1 h at a temperature in accordance with ISO 12824:2016.

5.2.13 Labelling the containers

All jars or other containers used for storing royal jelly shall be labelled with a number corresponding to the harvesting date and the location of the apiary.

5.2.14 Cleaning queen cell cups and bar

Clean the surplus beeswax in the plastic queen cell cups and bar to reuse for continuous production of royal jelly.

5.2.15 Packaging

The packaging of royal jelly should be of food-grade standard.

5.3 Record and file management

5.3.1 The bee colonies should be numbered and recorded.

5.3.2 Establish a beekeeping production log, see [Table A.2](#) for an example of a log.

5.3.3 The beekeeping production log should be used as a file and kept in good condition for three years.

5.3.4 Temperature monitoring shall be carried out at the storage level of each batch in order to indicate in a register all the significant changes in temperature undergone by one or more specific batches with their duration, e.g. storage at 4 °C (from date and time to date and time) and at -18 °C (from date and time to date and time).

5.4 Mark and traceability

5.4.1 Indications on the royal jelly packaging or label shall be in accordance with the requirements in ISO 12824:2016.

5.4.2 The batch number shall contain the number, the type of royal jelly, traceability, the international code of origin country, and the month and year of production (see [Table A.1](#)).

5.4.3 While delivering the royal jelly, the beekeeper should provide a delivery note to the other party to provide clear evidence of traceability. See [Table A.1](#) for an example of delivery note.

5.4.4 All the information concerning bee nutrition should be specified in [Table A.1](#), and treatment for disease and pests should be specified in [Table A.2](#).

6 Storage and transportation

Storage and transportation shall be in accordance with the requirements in ISO 12824:2016.

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