



Bhutan Organic Standard

BOS 02.2022



National Centre for Organic Agriculture (NCOA)

Department of Agriculture

Ministry of Agriculture and Forests (MoAF)

Royal Government of Bhutan

TABLE OF CONTENT

FOREWORD	iii
1. Introduction.....	1
1.1. Principles of Organic Agriculture.....	3
1.2. Bhutan Organic Standard	4
1.3. Scope of the Bhutan Organic Standard.....	4
1.4. The Objectives of the Bhutan Organic Standard.....	5
2. Terms and Definitions.....	7
3. Normative references.....	17
4. Organic Agriculture and Ecosystem Management.....	18
4.1. Ecosystem Management.....	18
4.2. Soil and Water Conservation.....	21
4.3. Genetically Modified Organism (GMO) and Nanotechnology.....	22
4.4 Wild Collection.....	23
5. General Requirements for Organic Production.....	25
5.1. General Requirements.....	25
5.2. General Conversion Requirements.....	26
6. Crop Production.....	28
6.1 Seeds and Planting Materials.....	28
6.2. Conversion Period for Crop Production.....	29
6.3. Diversity in Crop Production.....	30
6.4. Soil Fertility and Fertilisation.....	31
6.5. Pest Management and Growth Regulators.....	32
7. Mushroom Production.....	35
8. Animal Husbandry.....	38
8.1. Conversion and Parallel Production in Livestock Production.....	38
8.2. Animal Management.....	40
8.3. Breeds.....	42
8.4 Mutilations.....	43
8.5 Animal Nutrition.....	43
8.6. Veterinary Medicine.....	47
8.7. Transport and Slaughter.....	49
8.8. Beekeeping (Apiculture).....	50

9. Aquaculture Production.....	54
9.1. Conversion to Organic Aquaculture.....	54
9.2. Aquatic Ecosystems.....	55
9.3. Aquatic Plants	55
9.4. Breeds and Breeding.....	56
9.5. Aquatic Animal Nutrition.....	57
9.6. Aquatic Animal Health and Welfare.....	57
9.7. Aquatic Animal Transport and Slaughter.....	58
10. Processing, Handling and Storage.....	60
10.1. Requirements for Processing, Handling and storage.....	60
10.2. Ingredients and Additives in Processing.....	64
10.3. Processing Methods.....	64
10.4. Pest and Disease Control.....	64
10.5. Packaging.....	66
10.6. Labelling.....	66
11. Social Welfare.....	69
12. APPENDICES.....	71
APPENDIX 1: CRITERIA FOR SUBSTANCES USED IN ORGANIC PRODUCTION AND PROCESSING.....	71
APPENDIX 2: FERTILIZERS AND SOIL CONDITIONERS.....	79
APPENDIX 3: CROP PROTECTANTS AND GROWTH REGULATORS.....	82
APPENDIX 4: SUBSTANCES FOR USE IN LIVESTOCK PRODUCTION.....	85
APPENDIX 5 – TABLE 1: LIST OF APPROVED ADDITIVES.....	90
APPENDIX 5- TABLE 2: PROCOESSING AIDs.....	92
APPENDIX 5- TABLE 3a: FLAVOURING AGENTS.....	95
APPENDIX 5- TABLE 3b: OTHERS.....	96
APPENDIX 5- TABLE 4: INDICATIVE LIST OF EQUIPMENT CLEANSERS AND DISINFECTANT.....	97
APPENDIX 5- TABLE 5 : PREPARATION OF MICRO-ORGANISMS AND ENZYMES IN FOOD PROCESSING.....	100



མོ་ནམ་དང་ནག་ཚལ་ལྷན་ཁག།
ROYAL GOVERNMENT OF BHUTAN
 Ministry of Agriculture and Forests
 Thimphu : Bhutan



ལྷན་པོ།
MINISTER

FOREWORD

The Ministry of the Agriculture and Forests (MoAF) is pleased to publish the Bhutan Organic Standard (BOS) Version 2022. This document is developed under the lead of National Centre for Organic Agriculture (NCOA), Yusipang with technical contributions by the concerned agencies under the MoAF. The amendments in the document include, additional section on mushroom, and appendix on criteria for substances used in organic production and processing and review of animal husbandry, beekeeping, aquaculture and other minor changes.

Furthermore, BOS Version 2022 is officially enlisted under the IFOAM Family of Standards. After getting approved under the Family of Standards, following benefits can be reaped:

1. Gain credibility through official endorsement of our Standard
2. Efficiently communicate the strengths of our standard
3. Access other OGS services that are contingent upon family approval
4. Set a basis for possible (not compulsory) entrance into bi-or multi-lateral equivalence agreements
5. Add value to our standard by increased market access to our client

On behalf of the MoAF, Royal Government of Bhutan, I would like to acknowledge and thank IFOAM-International especially the OGS department for continued support, technical guidance, feedback and assessment to enlist Bhutan Organic Standard (BOS)Version 2022 under the IFOAM Family of Standards. And our special thanks also goes to the World Board of IFOAM-Organic Internationals for the review,

I also anticipate that, this document will strengthen our overall Bhutan Organic Regulation and Certification System.


 Yeshey Penjore

1. Introduction

Agriculture in Bhutan is characterised largely by traditional and semi-commercial farming systems with no or minimal external inputs. However, since 1980's, synthetic agro-chemicals like fertilisers and pesticides were used in agriculture. The use of these chemicals are concentrated among farming communities around cities and towns.

The cost of fertilisers, pesticides and other agrochemicals are on the rise with severe impact on the cost of production in farming. The developed nations, with enormous farm subsidies on these agro-chemicals and technologies, are in position to take up intensive farming and produce at a competitive price. However, in the developing countries especially in a mountainous region like Bhutan, where farming to a large extent is subsistence, the intensive farming technologies are limited by difficult geographical terrains and lean subsidy. Amongst the viable alternatives which are economically feasible, resource conserving and locally adaptable, organic agriculture is gaining momentum all over the globe. Further, there is a growing awareness and demand all over the world on production and consumption, safe and nutritious organic food.

The biggest problems facing global agriculture today are decline in food production, degeneration of native soil fertility and deterioration in environmental quality. The tremendous demand for

organically produced food at the international market is evident from the growing retail sales of the organic products in the developed countries. U.S, Europe and Japan are the biggest markets for the organically grown products. The growing awareness on healthy food and increasing demand of organic products in the international market has led to the creation of new export avenues for the developing countries.

Organic farming is a production system that excludes the use of synthetically compounded fertilisers, pesticides and growth regulators. It relies on organic manures produced from farm wastes and other biomass. It also encompasses a conglomeration of various techniques and practices like intercropping, mulching, cover cropping, trap cropping etc. Organic farming also employs various biological pest control methods, which eliminates the use of synthetic chemicals even at the storage levels.

A good understanding of agro ecological parameters of the locality or region is required to make organic farming a sustainable and feasible production system. Eventually, this helps to adopt locally suitable methodologies with a proper and appropriate combination of various resources available on the farm. Being a holistic production management system, organic farming will promote and enhance environmental quality including biogeochemical cycles and

soil floral and faunal activities. The stress is on improving the on-farm management rather than off-farm external inputs.

Though there is a growing demand for safe food products in the international market, the aim of organic agriculture is not export alone. It has a great role in improving the livelihoods and health of farming communities by practicing clean and low-cost production system. Organic farming will also contribute to conservation of biodiversity and environment. The most important factor in organic agriculture is that all the inputs can be prepared in the farm and the off-farm inputs can be reduced to the maximum extent possible.

1.1. Principles of Organic Agriculture

The main principles of Organic agriculture are:

a) Principle of Health

The health of the human beings and communities cannot be separated from the health of the ecosystems. Healthy soil produces healthy crops and create healthy environment.

b) Principle of Ecology

Organic agriculture should attain ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity. The management practices must be adapted to the local conditions, ecology, culture and scale.

c) Principle of Fairness

Fairness is characterised by equity, respect, justice and stewardship of the shared world both among people and in their relations to other living beings. Organic agriculture should provide food sovereignty, reduction of poverty and good quality of life to all.

d) Principle of Care

Precaution and responsibility are the key concerns in management, development and technology choices in Organic agriculture. Along with scientific understanding, practical experience, traditional wisdom, indigenous knowledge which are time tested provide valid solutions to ensure agriculture is healthy, safe and ecologically sound and provided to consumers in a trustworthy manner.

1.2. Bhutan Organic Standard

The Royal Government of Bhutan (RGOB) having concern for the health, well-being and happiness of its citizens finds it necessary to institute a system to assure them a supply of food and food materials free from unnatural treatments or additives or synthetic agro-chemicals which cause series of health and environment hazard. Considering the growing demand for safe produce and desire to support farmers of Bhutan with organic agriculture technologies, there is a need to develop a domestic organic standard.

1.3. Scope of the Bhutan Organic Standard

The Bhutan Organic Standard covers the following areas:

- primary production
- wild collection
- processing of food and feed
- packaging and labelling

- warehousing, transport and distribution
- Social Welfare
- Approval of prior certification for the purpose of sourcing organic ingredients or imported final products.

1.4. The Objectives of the Bhutan Organic Standard

- a) To produce safe, nutritious and high-quality food according to principles of Organic agriculture ensuring a healthy population in a healthy environment.
- b) To define the expectations for Bhutan's organic production and provide a basis for labelling of organic products.

The development of the Bhutan Organic Standard is guided by the following common objectives of organic standards, as established in the IFOAM-Organics International COROS norm employing long-term, ecological, systems-based organic management.

- Assuring long-term, biologically-based soil fertility.
- Avoiding/minimising synthetic inputs at all stages of the organic product chain and exposure of people and the environment to persistent, potentially harmful chemicals.
- Minimising pollution and degradation of the production/processing unit and surrounding environment from production/processing activities.
- Excluding certain unproven, unnatural and harmful technologies from the system.
- Avoiding pollution from surrounding environment.

- Treat animals responsibly.
- Promote and maintain the natural health of animals.
- Maintaining organic integrity throughout the supply chain.
- Providing organic identity in the supply chain.
- Treat employees and workers with fairness, respect, justice, equal opportunities and non-discrimination.

These objectives are addressed by the following guidelines in international organic standards:

- Use of cultural practices and natural substances are preferred and the uses of synthetic, off-farm materials are avoided.
- Farming is adapted to local conditions, stages of development and specific husbandry practices,
- Farming maintains and enhances soil fertility, prevents and combats soil erosion, and minimises pollution. Farming aims at producing products of high quality and safety.
- Wastes and by-products of plant and animal origin are recycled as input in plant and livestock production.
- Production decisions take account of the local or regional soil, agro-climatic and ecological balances.
- Plants are primarily fed through the soil ecosystem.
- Maintenance of animal and plant health are based on preventative techniques including selection of local

- Feed for livestock comes primarily from the holding where the animals are kept or is produced in cooperation with other organic farms in the same region.
- The highest level of animal welfare is observed.
- Local species and varieties of seed, planting material, and animals well adapted to local conditions, are favoured, due to their vitality and their resistance to disease and health problems and for conservation.
- Livestock feed is composed essentially of agricultural ingredients from organic farming and of natural substances.
- Husbandry practices that enhance the immune system and strengthen the natural defence against diseases are used.
- Genetically Modified Organisms (GMOs) and products produced by GMOs are not used.
- Traditional and indigenous knowledge used for farming practices, healthcare and processing are included and preserved for practice.
- Human rights and labour laws are respected and observed.

2. Terms and Definitions

Additive

A substance that is added to a processed product for a technological purpose and becomes a component of the final product and/or affects its characteristics.

Aeroponic

The process of growing plants in an air or mist environment without the use of soil or an aggregate medium.

Biodegradable

Capable of being decomposed by bacteria or other biological means and includes: compost, green manures, plant and animal waste.

Biodiversity

Variety of life forms and ecosystem types on earth which includes genetic diversity (i.e., diversity within species), species diversity (i.e., the number and variety of species), and ecosystem diversity (total number of ecosystem types).

Breeding

Conscious selection of plants or animals to reproduce and/or to further develop desired characteristics in succeeding generations.

Buffer zone

A clearly defined and identifiable boundary area bordering an organic production site and adjacent areas that is established to avoid contact with substances which shall not be used according to this standard.

Carcinogenic

Any natural or artificial substance that can produce or trigger cancer.

Conformity Assessment

Procedure by which a written assurance is given by the conformity assessment body that a clearly identified production or processing system has been systematically assessed and conforms to the specified requirements.

Conformity Assessment Body

The body that conducts conformity assessment. Conformity assessment, also known as compliance assessment is any activity to determine, directly or indirectly, that a process, product, or service meets relevant technical standards and fulfils relevant organic requirements.

Contamination

Pollution of organic product or land; or contact with any material that would render the product unsuitable for organic production or as an organic product.

Conventional

Farming/management systems or products that is not organic or organic “in conversion”.

Conversion

The process of change from conventional agricultural activities to organic farming.

Conversion period

The time between the start of organic management and the time when crops and animal products qualify as organic based on the Bhutan Organic Standard.

Crop rotation

The practice of alternating the annual and/or biennial crops grown in a certain field in a planned pattern or sequence so as to break weed, pest, and disease cycles and to maintain or improve soil fertility and the content of organic matter.

Disinfectant

A product that minimises by physical or accepted chemical means, the number of harmful micro-organisms in the environment, to a level that does not compromise food safety and suitability.

Farm Diary

Documentation of routine management practices for traceability.

Farm unit

An agricultural farm, area or production unit managed organically, by a farmer or a group of farmers.

Genetic diversity

Genetic diversity means the variability among living organisms from agricultural, forest and aquatic ecosystem. This includes diversity within species and between species.

Genetic engineering

A set of techniques from molecular biology (such as recombinant DNA) by which the genetic material of plants, animals, micro-organisms, cells, and other biological units are altered in ways or with results that could not be obtained by methods of natural mating and reproduction or natural recombination. Techniques of genetic modification include, but are not limited to, recombinant DNA, cell

fusion, micro and macro injection, encapsulation, gene deletion, and doubling. Genetically engineered organisms do not include organisms resulting from techniques such as conjugation, transduction, and natural hybridisation.

Genetically Modified Organism (GMO)

A plant, animal, or microbe that has been transformed by genetic engineering.

Good Manufacturing Practices (GMP)

Good manufacturing practices are the practices required in order to conform to the guidelines recommended by agencies that control authorisation and licensing for manufacture and sale of food.

GMO derivative

A substance that is produced by or from a GMO. This is traced one step back from the substance to its source. 'Produced from GMO' means that it consists in whole or in part of a GMO. 'Produced by GMO' means that it is a GMO metabolite.

Green manure

A leguminous crop which is incorporated into the soil for soil improvement.

Habitat

An area over which a plant or animal species naturally exists; the area where a species occurs. Also used to indicate types of habitat e.g., seashore, riverbank, woodland, and grassland.

Handling

Manual or mechanical carrying, moving, delivering or working with something.

Hazard Analysis at Critical Control Point (HACCP)

A systematic process that identifies food safety hazards, critical control points, critical limits, corrective actions, documentation and integrates monitoring procedures to ensure food safety.

Homeopathy

Treatment of disease based on administration of remedies prepared through successive dilutions of a substance that in higher concentration produces symptoms in healthy subjects similar to those of the disease itself.

Hydroponic systems

Crop production systems in inert media or water using dissociated nutrients as the prime source of nutrient supply.

Ingredient

Any substance, including a food additive, used in the manufacture or preparation of a food or present in the final product, although possibly in a modified form.

Inspection

The site visit to verify that the performance of an operation is in accordance with the standard.

Irradiation

Processing of food products by ionising radiation, specifically gamma rays, X-rays, or accelerated electrons capable of altering a food's molecular structure for the purpose of controlling microbial contaminants, pathogens, parasites, and pests in food, preserving food or inhibiting physiological processes such as sprouting or ripening.

Labelling

Any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale.

Livestock

Any domestic or domesticated animal including bovine porcine, caprine, equine, poultry and bees raised for food or in the production of food. The products obtained by hunting or fishing of wild animals shall not be considered as part of this definition.

Nanomaterials and substances

Materials deliberately designed, engineered and produced by human activity to be in the nanoscale range (approx. 1-300nm) because of very specific properties or compositions (e.g. shape, surface properties, or chemistry) that result only in that nanoscale. Incidental particles in the nanoscale range created during traditional food processing such as homogenisation, milling, churning, and freezing, and naturally occurring particles in the nanoscale range are not intended to be included in this definition.

Operation

For the purposes of this document an operation is an individual or business enterprise producing, processing or handling agricultural products.

Operator

An individual or a business enterprise practicing organic farming or organic processing or trading.

Organic agriculture

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.

Organic integrity

Adherence to the principles, objectives and standards for organic production.

Organic product

A product, which has been produced, processed, and/or handled in compliance with this standard or a standard, recognized as equivalent.

Organic production unit

A unit/holding or stock farm complying with organic standards.

Organically-produced feeding stuffs / feed materials

Feeding stuffs/feed material produced in accordance with the rules of production laid down in organic standards.

Organic seeds and planting material

Seed and planting material produced under verified organic system.

Parallel production

Any production where the same unit is growing, breeding, handling or processing the same products both in a certified organic and a non-certified organic system. A situation with organic and in conversion production of the same product is also parallel production.

Peat

Partially carbonised vegetable matter usually mosses, found in bogs and used as fertiliser and fuel.

Plant protection product

Any substance intended for preventing, destroying, attracting, repelling, or controlling any pest or disease including unwanted species of plants or animals during the production, storage, transport, distribution and processing of food, agricultural commodities, or animal feeds.

Processing aid

A substance or material not consumed as a food ingredient by itself but used in the processing of raw materials, food or its ingredients to fulfil a certain technological purpose during treatment or processing

and which may result in unintentional but unavoidable presence of residues or derivatives in the final product.

Prohibited

Not allowed.

Propagation

The reproduction of plants sexually (i.e., seed) or asexually (i.e., cuttings, root division).

Restrict

Limit a practice, generally to conditions under which it may be used.

Sanitise

To adequately treat the produce or food-contact surfaces by a process that is effective in destroying or substantially reducing the numbers of vegetative cells of micro-organisms of public health concern, and other undesirable micro-organisms, but without adversely affecting the safety and quality of the product.

Supply chain

A system of organisations, people, technology, activities, information and resources involved in moving a product or service from a supplier to a customer.

Sowa Rigpa

A traditional system of medicine and health care in Bhutan.

Sustainable

Use of a resource in such a way that the resource is not depleted or permanently damaged, hence is not used faster than it can be regenerated.

Synthetic

A substance that is formulated or manufactured by a chemical process or by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources. Substances created by naturally occurring biological processes are not considered synthetic.

Traditional knowledge

Indigenous knowledge generated, preserved and transmitted between generations and which may exhibit a high level of understanding of local resources, social and environmental conditions.

Water bodies

Sea, lakes, spring, rivers, streams, ponds and wetlands.

Wild Collection

Process of collecting products from wild or uncultivated areas (e.g. Community Forest). Wild collection includes the collection of plant and plant products, mushrooms, insects, but does not include game or wild caught fish.

3. Normative references

- Common Objectives and Requirements for Organic Standards (COROS), 2011.

- GOMA- Asia Regional Organic Standards (AROS),
- IFOAM Norms-Version July 2014,
- CAC/GL 32, Codex Alimentarius – Guidelines for the production, processing, labeling, and marketing of organically produced foods.

It is noted that compliance with all relevant national regulations such as food safety, takes precedence over the requirements of this organic standard.

4. Organic Agriculture and Ecosystem

Management

4.1. Ecosystem Management

General Principle

An ecosystem is a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit. The productivity of agricultural ecosystem depends on numerous species, such as soil micro-organisms, pollinators, predators of agricultural pests and the genetic diversity of the crops and livestock. Best practices for promoting their persistence in an agricultural landscape should be adopted. The basic requirements for enhancing ecosystems are as follows:

Standard Requirements

- 4.1.1.** Use vegetative cover as an effective soil and water-conserving measure, met through the use of minimum tillage, mulching, use of legume cover crops, green manure, etc.

- 4.1.2. Recycle farmyard manures and household wastes through composting.
- 4.1.3. Use nutrient recycling mechanisms through the use of crop rotations, crop/livestock mixed systems, agro-forestry and intercropping systems based on legumes.
- 4.1.4. Adopt conservation tillage rather than continuous deep ploughing.
- 4.1.5. Select crops and associated plants which have high nutrient use efficiency.
- 4.1.6. Enhance and manage biodiversity to provide natural pest regulation.
- 4.1.7. Address the resource needs of pollinators on the farm.
- 4.1.8. Promote a diversified farm landscape, including crop rotations and intercropping within the fields, but also diversification on the edges and outside of the farm, for example, in crop-field boundaries with windbreaks, shelterbelts, and living fences, which can improve habitat for beneficial insects, provide sources of food, organic matter, resources for pollinating bees, and in addition, modify wind speed and the microclimate.

- 4.1.9.** Maintain water bodies on farm to enhance natural habitat and conserve ecosystem besides utilisation on farm use.
- 4.1.10.** Primary ecosystems such as primary forests and wetlands shall not be cleared or drained for the purpose of establishing production.
- 4.1.11.** Carefully manage boundaries such as hedges, roads, paths, ditches, pastures, meadows, grassland, orchards, hedgerows, groups of trees and/or bushes, forest lines, waterways, pools, springs, wetlands, swamps and other water rich areas which are not used for intensive agriculture or aquatic production. They act as important wildlife corridors and help to maintain a diverse ecology, and provide a habitat for many beneficial animals and insects and shelter for livestock.
- 4.1.12.** Practices of Sowa Rigpa and other traditional practices for animal and plant management compatible with this standard are allowed in organic management.
- 4.1.13.** Land preparation by burning the vegetation is only allowed under the conditions specified in 4.2.3.

4.2. Soil and Water Conservation

General Principle

Soil and water conservation technologies and approaches are critical factors toward the sustainable use of the natural resource base for organic agriculture. The cropping system should incorporate efficient, economic and responsible ways of using the soil and water resources.

A pragmatic organic management plan should be in place to anticipate, address, and mitigate impacts on water resources including installation of eco-efficient effluent treatment or appropriate systems to recycle water without polluting the environment in the processing and handling units.

Standard Requirements

4.2.1. Use water resources in a sustainable manner. Follow water conservation techniques like timing of planting, efficient and appropriate scheduling of irrigation practices, enhancing organic matter content of soil and rainwater harvesting. Enhance efficiency of water use by preventing runoff and water logging.

4.2.2. Take appropriate measures to conserve topsoil and prevent erosion (mulching, minimum tillage, contour cultivation, strip

cropping, cover cropping, crop selection, etc.), compaction, salinisation, acidification and other forms of soil degradation.

4.2.3. Restrict land preparation by burning the vegetation. Burning may be allowed in cases wherein it is an established and well managed traditional management practice, in case of severe outbreak of pest and disease, in cases where it is necessary to stimulate seed germination or to remove intractable residues, or other such exceptional cases.

4.2.4. Recycle biodegradable wastes that are generated during crop production, processing and handling back to the soil through composting and other technologies.

4.2.5. Operators' farming systems shall not rely upon switching back and forth between organic and conventional management.

4.3. Genetically Modified Organism (GMO) and Nanotechnology

General Principle

Genetically Modified Organisms (GMOs) and their derivatives are excluded in organic production, processing and handling. Nanotechnology is also considered an unpredictable technology; hence its use is rejected in organic farming and processing.

Standard Requirements

- 4.3.1.** The deliberate use or negligent introduction of Genetically Modified Organisms (GMOs) or their derivatives is prohibited. This includes animals, seed, propagation material, feed, and farm inputs such as fertilisers, soil conditioners, or crop-protection inputs but excludes vaccines.
- 4.3.2.** Ingredients, additives, or processing aids derived from GMOs shall not be used in organic processing and handling.
- 4.3.3.** Inputs, processing aids, and ingredients shall be traced back one step in the biological chain from which they are produced to verify that they are not derived from GMOs.
- 4.3.4.** GMOs shall not be used in the conventional production activity on farms not fully converted to organic production.
- 4.3.5.** The use of nanomaterials is prohibited in organic production and processing, including in packaging and product contact surfaces. No substance allowed under this standard shall be allowed in nano form.

4.4 Wild Collection

General Principle

Wild collected products in Bhutan are a major source of off farm income which provides food, medicinal and aromatic products,

fodder, fibre and local construction materials. Collection of wild products should not threaten the species collected nor destroy the natural habitats of the wild species of plants and animals. Attention should be paid towards the maintenance and sustainability of the ecosystem while collecting wild products as per the requirements of the country.

Standard Requirements

- 4.4.1.** The location of the collected products and describe harvesting rules for their sustainable collection.
- 4.4.2.** Wild products shall be collected from a clearly defined collecting area and shall be within the list of species that are permissible by the Royal Government of Bhutan (RGOB).
- 4.4.3.** The collection area shall be at an appropriate distance from conventional farming areas, and pollution and contamination sources. The area must not be affected by improper treatment with prohibited substances (i.e., any substance other than those listed in Appendices 2 and 3).
- 4.4.4.** Collection of wild products shall be based on an approved Community Forest Management Plan or an approved NWFP Collection Agreement as approved by Royal Government of Bhutan (RGOB). The Management Plan or the Collection Agreement shall clearly indicate the location of the collected

products and describe harvesting rules for their sustainable collection.

5. General Requirements for Organic Production

5.1. General Requirements

General Principle

Some requirements in organic farming apply to all production operation, whether they do crop production, livestock production or mixed production. Those requirements are as follow:

Standard Requirements

5.1.1. Operators shall not use synthetic agro-chemical products like fertilisers, pesticides, growth hormones etc., that may endanger human health or the environment. Only substances listed in Appendix of this standard are permitted for use in Organic agriculture.

5.1.2. Operators shall maintain all records of their production, inputs used, farming operations undertaken, source of external inputs, processing and handling details, storage etc. in the prescribed format.

5.1.3. Appropriate measures should be taken by the operators to identify and avoid potential contamination. This includes barriers and buffer zones, cleaning of equipment and careful

selection of farm inputs, including water. Emphasis should be on identification and detection of the source of contamination by incorporating Hazard Analysis and Critical Control Points (HACCP) or similar procedures.

5.1.4. All equipment from conventional farming systems shall be properly cleaned and free from residues before being used on organically managed areas.

5.1.5. Whenever there is a reasonable suspicion of contamination, the Conformity Assessment Body shall ensure that an analysis of the relevant products and possible sources of pollution (soil, water, air and inputs) is undertaken to determine the source and level of contamination and that appropriate responses are taken.

5.1.6. For synthetic structure coverings, mulches, fleeces, insect netting and silage wrapping, only products based on polyethylene and polypropylene or other polycarbonates are permitted. These shall be removed from the soil after use and shall not be burned on the farmland.

5.2. General Conversion Requirements

General Principle

Transition to organic farming takes place gradually and effectively so that the food production does not suffer from the likely impact of

learning and adapting to a new farming system. This gradual process of change from the start of the organic management to certification of crops, animal husbandry and allied activities is called as conversion period. The entire farm, including animal husbandry and allied activities, should be encouraged to convert to organic according to this standard progressively over a period of time.

Standard Requirements

- 5.2.1.** The conventional farm shall be brought into organic management gradually over a period of time by appropriate planning and optimal utilisation of the resources available.
- 5.2.2.** This standard shall be applied to the organic management of the farm from the beginning of the conversion period onwards.
- 5.2.3.** The whole farm should be converted to organic production. If the whole farm is not converted, the organic and conventional parts of the farm shall be clearly and continuously separated to facilitate inspection. Production of the same crop in organic and conventional plots on the same farm (parallel production) is not allowed.
- 5.2.4.** The farm shall be inspected during the conversion period. The start of the conversion period shall be calculated from the start of organic management as indicated by the date of application

to the organic Conformity Assessment Body, provided that no prohibited substances are used after that.

6. Crop Production

6.1 Seeds and Planting Materials

General Principle

Preference should be for the use of good quality seeds, seedlings, and planting materials from organic or natural farming without contaminants.

Standard Requirements

- 6.1.1.** Traditional seeds or open pollinated seeds or local planting materials should preferably be used as they are naturally resistant to pest and diseases.
- 6.1.2.** Use organic and untreated seeds and planting materials whenever available. In case of unavailability of organic seeds, operators shall source in priority untreated conventional seeds or conventional seeds treated only with substances that are permitted in Appendices 2 and 3.
- 6.1.3.** In some case even such untreated seeds are not available, chemically treated seeds, seedlings, and planting materials may be used but this shall be documented in the Farm Diary. The operator shall demonstrate the apparent need for such use.

6.2. Conversion Period for Crop Production

General Principle

Conversion period enables the organic management system to build soil fertility and re-establish the balance of the ecosystem. The length of the conversion period should be adapted to the local agro-ecological conditions, past history of the use of the land and experience of the farmer or operator. It should provide sufficient time for the operator to stop the use of any restricted or prohibited inputs in the farm.

Standard Requirements

6.2.1. For annual crops, there shall be a period of at least 12 months organic management that meets all the requirements of this standard before the resulting product can be considered organic. For perennial crops, this period shall be 18 months.

6.2.2. The conversion period may be extended by the Confirmatory Assessment Body based on the identification and evaluation of relevant issues and risks e.g. contamination. In areas of heavy historical use of many years preceding the date of application to the Confirmatory Assessment Body, risk can be verified with required tests to bench mark the status and the conversion period could be extended.

6.2.3. The start of the conversion period shall be calculated from the start of organic management as indicated by the date of application to the organic Conformity Assessment Body, provided that no prohibited substances are used after that.

6.3. Diversity in Crop Production

General Principle

The foundation of organic production is soil and soil management. Organic crop production systems are based on improving the soil organic matter, soil fertility, conservation of topsoil and surrounding ecosystems which provide support for a diversity of species to thrive, while encouraging nutrient cycling and mitigating soil and nutrient losses.

Standard Requirements

6.3.1 Diversity in crop production shall be achieved by a combination of:

- a. a versatile and diverse crop rotation with legumes, green manures and deep rooting crops, and
- b. an appropriate coverage of the soil with diverse plant species during the year of production.

6.3.2. For annual crops, appropriate crop rotations shall be established.

6.3.3. For perennial crops, intercropping shall be adopted wherever possible.

6.4. Soil Fertility and Fertilisation

General Principle

Organic crop production systems produce terrestrial crops in soil-based systems. Maintaining soil fertility and biological activity of the soil is a key objective in organic farming. In order to achieve the objective, sufficient quantities of biodegradable materials of microbial, plant or animal origin should be returned to the soil. The biodegradable material of microbial, plant or animal origin produced on organic farms and natural minerals should form the basis of the fertilisation program.

Standard Requirements

- 6.4.1.** Hydroponic and aeroponic systems are prohibited for terrestrial crops.
- 6.4.2.** Operators shall adopt cost effective recycling method of nutrient substances, an appropriate crop rotation method, and effective fertilisation management to minimise nutrient losses.
- 6.4.3.** Accumulation of heavy metals and other pollutants shall be demonstratively prevented.
- 6.4.4.** Non-synthetic mineral fertilisers and fertilisers of biological origin shall be regarded as supplementary and not a replacement for nutrient recycling.
- 6.4.5.** Manures containing night soil (human excreta) shall not be used for organic farming.

- 6.4.6.** Natural mineral fertilisers shall only be used in a supplementary role to carbon-based materials to address long-term fertility needs.
- 6.4.7.** Natural mineral fertilisers shall be applied as far as possible in their natural form and shall not be rendered more soluble by chemical treatment (e.g. superphosphates).
- 6.4.8.** Only inputs listed in Appendix 2 may be used as fertilisers and soil conditioners in organic production. The Conformity Assessment Body shall lay down restrictions for the use of inputs such as mineral potassium, magnesium fertilisers, trace elements, manures and fertilisers with a relatively high heavy metal content and/or other unwanted substances, e.g. basic slag, rock phosphate and sewage sludge.
- 6.4.9.** Chilean nitrate and all synthetic nitrogenous fertilisers, including urea, are prohibited.
- 6.4.10.** Plant or animal origin materials degraded through microbial action and/or other natural factors shall form the basis of the fertilisation program.

6.5. Pest Management and Growth Regulators

General Principle

Organic management should attempt to prevent/reduce the damages caused by pests. A variety of measures like cultivating resistant varieties of crops, intercropping, mixed cropping, companion

planting, trap cropping, along with the use of pest repellents of natural origin should be used in farming.

Standard Requirements

6.5.1. Pests, diseases and weeds should be managed by adopting different techniques like physical, cultural, mechanical and biological practices appropriate to the region. Some of these measures are:

- a. cultivation of resistant species and varieties;
- b. appropriate crop rotations;
- c. mechanical practices for pest management like traps (pheromones, light traps), sound, etc.;
- d. biological practices like protection of natural enemies of pests through provision of favourable habitat, such as hedges, nesting sites and ecological buffer zones that maintain the original vegetation to nurture predators of pests;
- e. release of local predators and parasitoids and natural enemies;
- f. developing diversified ecosystems which includes agro-forestry, crop rotation, mixed cropping, intercropping, etc.;
- g. weed management;
- h. use of biodynamic preparations/traditional formulations prepared from farmyard manure, plants or local resources;
- i. mulching using locally available materials.

- 6.5.2.** When pests, diseases and weeds exceed the threshold limits, preparations of local plants, animals and micro-organisms that are prepared at the farm are permitted.
- 6.5.3.** Physical methods (hot water treatment) for pest, disease and weed management are permitted. Thermal sterilisation of soils to combat pests and diseases is prohibited. However, the Conformity Assessment Body may allow it in exceptional and case by case basis in instances of severe disease or pest infestation which cannot be remedied through crop rotations, renewal of soil or other measures permitted under this standard.
- 6.5.4.** In cases where the above measures are not effective, the active substances for pest, disease and weed management listed under Appendix 3 may be used. Active substances that do not appear on Appendix 3 are prohibited for use on organic farms.
- 6.5.5.** In case commercial formulated inputs are used, operators shall ensure that they have only active ingredients listed in Appendix 3, and that co-formulants (e.g. inerts and synergists) are not carcinogens, mutagens, teratogens or neurotoxins.
- 6.5.6.** The use of synthetic growth regulators are prohibited.
- 6.5.7.** The operator shall implement any measure imposed by the Ministry of Agriculture and Forests to prevent the spread of pests, parasites and infectious agents which could otherwise cause an epidemic.

7. Mushroom Production

General Principle

Organic mushroom production is an indoor activity under controlled environment. Mushroom production standard requirements will cover all edible mushrooms intended for human consumption.

Standard requirements

- 7.1.** During registration as organic operator, Organic Mushroom Management Plan need to be submitted to the Conformity Assessment Body.
- 7.2.** The operator shall maintain the entire production site including housing facilities in a way that prevents contact with prohibited substances with production site, tools and boxes/ trays, organically produced mushrooms and each and every step throughout the entire growing cycle including harvesting and post-harvesting process. Any wood or plant material used for construction of mushroom house, racks, substrate holding containers, boxes, trays etc. shall be free from prohibited substance treatment.
- 7.3.** Organic and non-organic production units must be in separate facilities separated by space and time and have separate ventilation systems, boxes, trays, tools, substrate holding racks etc. including facilities for compost production.

- 7.4. All substrates and growing media shall be prepared on the farm in compliance of these standards or sourced from organic or natural sources.
- 7.5. In cases where raw crop residue/ biomass is used without composting as substrate, such as straw, hay or grains, they shall be sourced from organic or natural farms where synthetic chemicals have not been used.
- 7.6. Logs, sawdust or other wood-based material when used as substrate shall come from wood, trees or logs that have not been treated with prohibited substances.
- 7.7. If organic substrates are not available, for a year, its consideration may be given, however from the next cropping cycle, they must use organic substrates.
- 7.8. In case of unavailability of organic raw material needed for making the substrate Conformity Assessment Body may allow the use of conventionally grown raw material up to a maximum limit of 25% for mushroom media or substrate.
- 7.9. GMO products/spawn is prohibited.
- 7.10. Mushroom production system on being converted to organic management shall undergo a minimum period of 12 months as conversion period from the date of registration as organic operator. During the conversion period all management practices must be in compliance of BOS requirements.

7.11. Preventive pest and disease management shall be the preferred approach. Cases where preventive measures are not sufficient to tackle the problem, refer Section 6 and Appendix 3. For sanitation and disinfection of establishment, equipment and facilities, products listed in Appendix 5 (Table 4) can be used.

8. Animal Husbandry

8.1. Conversion and Parallel Production in Livestock Production

General Principle

Organic animals are born and raised on organic holdings. Animal husbandry systems that change from conventional to organic production require a conversion period.

Standard Requirements

8.1.1. Animals shall be raised and managed organically. When organic livestock is not available, conventional animals may be brought in, according to the following maximum age limits:

- a. 2-day-old chick for meat production
- b. 14-week-old hens for egg production
- c. 2 weeks old for any other poultry category
- d. 6 weeks old for piglets and after weaning
- e. 24 weeks old for calves that have received colostrum and are fed a diet consisting mainly of full milk (for milk production only)
- f. 6 weeks for small ruminant: goat/sheep

8.1.2. Animal products shall be marketed as ‘organic’ only if the farm or relevant part of it has been under conversion and following the organic animal production standard. When

converting to organic production, animals shall undergo a conversion period according to the following:

- a. Meat 12 months (Beef/fish)
- b. Dairy 3 months
- c. Eggs 45 days
- d. Poultry and rabbits 45 days
- e. Pork /chevon 3 months

8.1.3. Products from the same type of animal and the same type of production which are both organic and non-organic (conventional or in-conversion) on the same farm shall not be sold as organic unless the production is done in a way that allows for the clear and continuous separation of the organic and non-organic production.

8.1.4. Breeding stock may be brought in from conventional farms. A maximum of 10% of the adult animals of the same species per annum can be brought into the farm. For brought-in breeding stock the Conformity Assessment Body may allow more than 10% per annum in the following cases and with specific time limits:

- a. unforeseen severe natural or manmade events;
- b. considerable enlargement of the farm;

- c. establishment of a new type of animal production on the farm;
- d. small holdings.

8.2. Animal Management

General Principle

Animal husbandry is an important component in organic agriculture and is based on harmonious relationship between environment and livestock. The physiological and the behavioural needs of the livestock should be given prime importance.

Standard Requirements

8.2.1. The operator shall:

- a. Provide feed rations that meet the nutritional and dietary requirements of the species, for example access to roughage for ruminants.
- b. Maintain stocking rates, flock or herd sizes appropriate to the welfare and health of the animals.
- c. Adopt methods of livestock management that reduce stress, promote animal health and welfare, prevent disease and parasitism, and avoid the use of chemical allopathic veterinary drugs.
- d. Adopt management practices that promote sustainable land and water use.

- 8.2.2.** Animals shall have access to fresh air, water and feed and shall be handled according to the natural behaviour of the animal. They shall have access to protection from direct sunlight, excessive noise, heat, rain, mud, and wind to reduce stress.
- 8.2.3.** Animals shall have sufficient free movement during all stages of their life cycles, according to their natural behaviour. They shall have opportunity to express normal patterns of behaviour, such as space to stand naturally, lie down easily, move around freely, groom themselves, sleep and nest comfortably, as well as assume all natural postures and movements such as stretching, etc.
- 8.2.4.** Housing conditions shall ensure enough lying and resting areas that correspond to the natural needs of the animals. Animals shall be provided with natural bedding where appropriate. Poultry, rabbits and pigs shall be kept in accordance with good animal husbandry practices.
- 8.2.5.** Extensive mode of livestock management may be practised on natural land, provided the grazing management does not degrade soil and water resources.
- 8.2.6.** Tethering may be practised, provided it does not affect the wellbeing of the animal. The animal shall have access to feed, shade, and water when needed and shall be allowed regularly

to move. The tethering should not cause wounds or physically harm animals.

8.2.7. Animals shall have the possibility of grazing provided there is no exploitation of grazing resources. In situations wherein grazing is not possible stall feeding shall be adopted as last resort provided that animal welfare is not compromised. Under stall feeding the animals have access to outdoor run on a regular basis.

8.3. Breeds

General Principle

Breeds are adapted to local conditions.

Standard Requirements

8.3.1. Breeding systems shall be based on breeds that can reproduce successfully under natural conditions.

8.3.2. Artificial insemination is permitted.

8.3.3. Embryo-transfer techniques and cloning or genetically engineered species shall not be used.

8.3.4. Use of hormones for inducing heat/birth is prohibited unless used for individual animals for medical reasons and under veterinary advice.

8.4. Mutilations

General Principle

Organic farming respects the animal's distinctive characteristics.

Standard Requirements

8.4.1. Mutilations shall not be done, except in the following cases:

- a. castration;
- b. ringing;
- c. disbudding of horns and dehorning (only of young animals).

Mutilations shall be done in such a way that the suffering of the animal is minimised. Anaesthetics shall be used where appropriate.

8.5. Animal Nutrition

General Principle

All organic feed shall come from the farm itself or be produced within the locality and shall be offered to the animals in a form allowing them to execute their natural feeding behaviour and digestive needs.

Standard Requirements

8.5.1. At least 50% of the feed shall come from the farm unit itself or shall be produced in cooperation with other organic farms in the locality. The Conformity Assessment Body shall allow

exceptions with regard to local conditions under a set time limit for implementation.

8.5.2. For the calculation of feeding allowances only, feed produced on the farm unit during the first year of organic management may be classed as organic. This refers only to feed for animals that are being produced within the farm unit. Such feed may not be sold or otherwise marketed as organic.

8.5.3. Animals shall be fed 100% organic feed whenever possible. Under situations where it is impossible to obtain certain feeds from organic farming sources, the Conformity Assessment Body may allow a percentage of feed consumed by farm animals to be sourced from conventional farms. In such cases, the percentage of non-organic feed shall not exceed 15% dry matter per ruminant and 30% dry matter per non-ruminant calculated on an annual basis. Wild grazing in uncontaminated areas is considered organic feed.

Operators may feed a higher percentage of non-organic feed for a limited time under specific conditions, following extreme and exceptional weather conditions or man-made or natural disasters beyond the control of the operator, and subject to case-by-case approval by the National Centre for Organic Agriculture (NCOA).

8.5.4. The following products shall not be included in the feed:

- a. Meat, bone, and other abattoir waste products to ruminants;
- b. Slaughter waste of same species;
- c. All kinds of excrements including, droppings, dung or other manure;
- d. Feed subjected to solvent extraction (e.g., hexane or the addition of other chemical agents);
- e. Synthetic amino acids and amino acid isolates;
- f. Urea and other synthetic nitrogen compounds;
- g. Synthetic growth promoters or stimulants;
- h. Antibiotics;
- i. Preservatives (except when used as a processing aid);
- j. Synthetic appetisers;
- k. Artificial colouring agents;
- l. Genetically engineered organisms or products.

8.5.5. Animals may be fed vitamins, trace elements, and supplements from natural sources. Synthetic vitamins, minerals, and supplements may be used when natural sources are lacking in quantity or quality.

8.5.6. The following fodder preservatives maybe used:

- a. bacteria, fungi and enzymes;
- b. by-products of food industry (e.g. molasses);
- c. plant based products;
- d. minerals.

No synthetic preservatives shall be used in fodder, however, synthetic chemical fodder preservatives such as acetic, formic and propionic acid are permitted in severe weather conditions.

8.5.7. Young stock from mammals shall be raised on maternal milk or organic whole milk from their own species. Animals shall be weaned only after a minimum period as specified below:

- a. Calves: 3 months
- b. Piglets: 6 weeks
- c. Lambs and kids: 8 weeks

If organic whole milk is not available, conventional whole milk shall be used. Milk replacements are allowed only in emergencies and shall not contain ingredients mentioned in 8.5.4.

8.6. Veterinary Medicine

General Principle

The management practices should promote and maintain the health and well-being of animals through balanced organic nutrition, good living conditions, appropriate selection of breed that are resistance to diseases, parasites and infections. The sick and injured animals should be given timely and adequate treatment.

Standard Requirements

8.6.1. Select appropriate breeds or strains of animals suitable to the locality or region.

8.6.2. Provide good quality organic feed, regular exercise, and access to pasture or runs in the open air.

8.6.3. Have appropriate stocking densities.

8.6.4. Allow grazing rotation and management.

8.6.5. The operator shall not practice any prophylactic use of synthetic allopathic veterinary drugs, except vaccines. Vaccines shall be used only in areas wherein the diseases are forecasted or endemic to the region and where these diseases cannot be controlled by other management techniques. The vaccines shall be used when the vaccinations are legally required in the region.

8.6.6. When an animal is sick or injured despite preventive measures, it shall be treated promptly and adequately. Animal husbandry practices appropriate to the requirements of each species of animals should be adopted. As a first option, homeopathic, phyto-therapeutic, traditional and other alternative treatments shall be used if they are proven to be effective in curing sickness or healing an injury. The products listed in Appendix 4 may be used for treatment of animals. Whenever illness is observed in animals the operator should determine the cause and prevent future outbreaks by adopting appropriate management practices.

8.6.7. An operator may use chemical allopathic veterinary drugs or antibiotics, under the supervision of a qualified veterinarian, only if the preventive and alternative practices mentioned above are unlikely to be effective in curing sickness or healing an injury. The use of such medication shall be subject to isolation and withdrawal periods not less than double of that required by legislation, or a minimum of 14 days, whichever is longer.

8.6.8. Operators shall not withhold medication of sick or injured animals, even if the use of such medication will cause the animal to lose its organic status.

8.6.9. The use of the following substances is prohibited:

- a. synthetic growth promoters;
- b. substances of synthetic origin for production, stimulation or suppression of natural growth;
- c. hormones for heat induction and heat synchronisation unless used for an individual animal against reproductive disorders, justified by a qualified veterinarian.

8.7. Transport and Slaughter

General Principle

The animals should be subjected to minimum stress during transport and slaughter.

Standard Requirements

8.7.1. The following conditions shall be met during transportation and slaughter:

- a. the transport distance and frequency should be minimised as much as possible
- b. animals shall be regularly checked on during transportation
- c. there shall be appropriate transportation medium for each animal
- d. water and feed shall be provided as appropriate during transport

e. stress reducing measures shall be used, like allowing sufficient rest time, maintaining existing groups of animals, etc.

8.7.2. Each animal shall be stunned before being bled to death. The equipment used for stunning shall be in good working order.

8.7.3. Throughout the different steps of the process of transportation and slaughter, there shall be a person responsible for the well-being of the animal.

8.7.4. Animals shall be handled in a caring manner during transport and slaughter. The use of electric sticks and other such instruments are prohibited.

8.7.5. Chemically synthesised tranquillisers or stimulants shall not be given prior to or during transport.

8.7.6. Each animal or group of animals shall be identifiable or traceable during all stages of transportation and slaughter.

8.8. Beekeeping (Apiculture)

General Principle

Honey bees play a very important role not only in providing honey as a food and nutrient source but also plays an important role in crop production and ecosystem services. They facilitate the pollination of a variety of plant species.

Standard Requirements

- 8.8.1.** For commercial production, hives shall be placed on organically managed fields or wild/natural areas. The area within a 3km radius of the hives shall consist of organically managed field, uncultivated areas/or and wild natural areas for continuous food supply (honeydew, nectar and pollen) to meet the nutritional needs of the bees. Beehives shall be at least 5 km away from conventional field with intensive use of chemicals and/or from other important source of chemical contamination.
- 8.8.2.** The hives should consist of natural materials with no risk of contamination to the environment or the bee products. The conversion period for a hive from conventional farm shall be one year.
- 8.8.3.** In the choice of bee strains, the operator shall take into account the capacity of the bees to adapt to the local conditions, their disease resistance, the safety and integrity of the native insect population, and pollination requirements.
- 8.8.4.** If introduced, the bees shall come from organic production units (if available) or otherwise from traditional beekeeping or from a wild hive provided that extraction of the wild queen does not result in the destruction of the wild colony, ensure

that the wild colony has enough time to produce new queen before winter.

8.8.5. For starter combs, preferably organic wax shall be used. During unavailability of organic wax, conventional wax may be used. Precautions should be taken that the conventional wax is not contaminated with chemical pesticides. During the conversion period, wax under conversion may be used.

8.8.6. The operator shall follow harvesting guidelines recommended by Department of Livestock (DoL). Sufficient food reserves shall be left behind at the end of the harvesting season for the survival of the colony during the dormancy period. Any supplementary feeding in response to unexpected need shall be carried out only between the last honey harvest and the start of the next nectar or honeydew flow period. In such cases, organic honey or organic sugar shall be used.

8.8.7. For pest and disease control, the following may be used:

- a. lactic, oxalic, acetic acid;
- b. sulphur;
- c. natural etheric oils (e.g. menthol, eucalyptol, camphor);
- d. *Bacillus thuringiensis*;
- e. steam and direct flame and caustic soda for hive disinfection;
- f. glycerol.

If these processes and substances fail, veterinary medicinal products may be used. If allopathic chemically synthesised medicinal products are used, the bee products shall not be sold as organic. Treated hives shall undergo a conversion period of one year. If the treatment contaminates the wax, the wax shall be replaced.

8.8.8. The methods of harvesting of bee products by burning the hives and destroying the bees in the combs is prohibited. During harvesting protective gears shall be used and smoking shall be kept to a minimum. Acceptable smoking materials shall be of natural origin. Chemical synthetic repellents shall not be used during the harvest of bee products.

8.8.9. Any form of mutilations (such as clipping of the wings of queen bees) is prohibited.

8.8.10. Temperature of honey shall be maintained as low as possible, and should not exceed 45 degrees centigrade, during the extraction and processing of products derived from bee keeping.

8.8.11. Bee products can be sold as organically produced when the requirements of this standard have been complied with for at least one year.

9. Aquaculture Production

9.1. Conversion to Organic Aquaculture

General Principle

Conversion in organic aquaculture production reflects the diversity of species and production methods.

Standard Requirements:

- 9.1.1.** Operators shall comply with all the relevant general requirements of other sections of this standard.
- 9.1.2.** The conversion period of the production unit shall be at least one life cycle of the organism.
- 9.1.3.** Operators shall ensure that conversion to organic aquaculture addresses environmental factors, and past use of the site with respect to waste, sediments and water quality.
- 9.1.4.** Production units must be located at an appropriate minimum distance from contamination sources and conventional aquaculture.

9.2. Aquatic Ecosystems

General Principle

Organic aquaculture management maintains the biodiversity of natural aquatic ecosystems, the health of the aquatic environment, and the quality of surrounding aquatic and terrestrial ecosystem.

Standard Requirements:

- 9.2.1.** Aquatic ecosystems shall be managed to comply with relevant requirements of Section 4.
- 9.2.2.** Operators shall take adequate measures to prevent escapes of introduced or cultivated species and document any that are known to occur.
- 9.2.3.** Operators shall take verifiable and effective measures to minimise the release of nutrients and waste into the aquatic ecosystem.
- 9.2.4.** Fertilisers and pesticides are prohibited unless they appear in Appendices 2 and 3.

9.3. Aquatic Plants

General Principle

Organic aquatic plants are grown and harvested sustainably without adverse impacts on natural areas.

Requirements:

- 9.3.1.** Aquatic plant production shall comply with the relevant requirements of Sections 4, 5 and 6.
- 9.3.2.** Harvest of aquatic plants shall not disrupt the ecosystem or degrade the collection area or the surrounding aquatic and terrestrial environment.

9.4. Breeds and Breeding

General Principle

Organic aquatic animals begin life on organic units.

Standard Requirements:

- 9.4.1.** Aquatic animals should be raised organically from birth.
When organic aquatic animals are not available, conventional animals may be brought-in but shall spend not less than two thirds of their life span in the organic system.
- 9.4.2** Operators shall not utilise artificially polyploid organisms or artificially produced monosex stock.
- 9.4.3** Aquatic animal production systems shall use breeds and breeding techniques suited to the region and the production method.

9.5. Aquatic Animal Nutrition

General Principle

Organic aquatic animals receive their nutritional needs from good quality, organic sources.

Standard Requirements:

9.5.1. Aquatic animals shall be fed organic feed. However, if organic feed is of inadequate quantity or quality, operators may feed up to 20% of non-organic feed. In case, specific animal feeds are not available, other feeds may be given upon approval from DoL. Non-organic aquatic animal protein and oil sources must be from independently verified sustainable sources.

9.5.2 Prophylactic use of any synthetic allopathic veterinary drug is prohibited. Substances of synthetic origin used to stimulate production or suppress natural growth are prohibited.

9.6. Aquatic Animal Health and Welfare

General Principles

Organic management practices promote and maintain the health and wellbeing of animals through balanced organic nutrition, stress-free living conditions appropriate to the species and breed selection for resistance to diseases, parasites and infections.

Standard Requirements:

- 9.6.1.** The operator shall take all practical measures to ensure the health and wellbeing of the animals through preventative animal husbandry practices.
- 9.6.2.** Prophylactic use of veterinary drugs is prohibited.
- 9.6.3.** Operators must use natural methods and medicines, as the first choice, when treatment is necessary. Use of chemical allopathic veterinary drugs and antibiotics is prohibited for invertebrates.
- 9.6.4.** Synthetic hormones and growth promoters are prohibited for use to artificially stimulate growth or reproduction.
- 9.6.5.** Stocking densities do not compromise animal welfare.
- 9.6.6.** Operators shall routinely monitor water quality, stocking densities, health, and behaviour of each cohort (school) and manage the operation to maintain water quality, health, and natural behaviour.

9.7. Aquatic Animal Transport and Slaughter

General Principle

Organic aquatic animals are subjected to minimum stress during transport and slaughter.

Standard Requirements:

- 9.7.1.** The operator shall handle live organisms in ways that are compatible with their physiological requirements.
- 9.7.2.** Operators shall implement defined measures to ensure that organic aquatic animals are provided with conditions during transportation and slaughter that meet animal specific needs and minimise the adverse effects of:
- a. diminishing water quality;
 - b. time spent in transport;
 - c. stocking density;
 - d. toxic substances;
 - e. escape.
- 9.7.3.** Aquatic animals shall be handled, transported and slaughtered in a way that minimises stress and suffering, and respects species-specific needs.

10. Processing, Handling and Storage

10.1. Requirements for Processing, Handling and Storage

General Principle

To provide consumers with, hygienic, nutritious and high-quality supplies of organic products without compromising their integrity, it is important for the organic producers and processors to adhere to the processing, handling and storage requirements. The processing and handling of organic products shall be done separately. Care should be taken that the non-organic products should not get mixed during processing, handling and storage.

Standard Requirements

10.1.1. The integrity of the organic products shall be maintained through the whole value chain. The mixing of organic with non-organic products shall be avoided. Organic ingredients and products shall be stored separately. In case of limited storage space, the organic products shall be properly labelled and physically segregated.

10.1.2. The operator shall have a plan to prevent and control pollutants and contaminants.

10.1.3. Organic management employs only those systems for cleaning and disinfecting surfaces, machinery and processing facilities that prevent contamination of organic product by substances

prohibited in organic farming and handling. Water and substances that appear in Appendix 5 (Table 4), may be used as equipment cleansers and equipment disinfectants that may come into direct contact with the product.

Operations that use other cleanser, sanitisers, and disinfectants on product contact surfaces shall use them in a way that does not contaminate the product. The operator shall perform an intervening event between the use of any cleaner, sanitiser, or disinfectant and the contact of organic product with that surface sufficient to prevent residual contamination of that organic product.

10.1.4. Besides storage at ambient temperature, the following special conditions of storage are permitted:

- i Controlled atmosphere;
- ii Cooling;
- iii Drying;
- iv Ethylene gas as ripening agent;
- v Freezing;
- vi Humidity regulation.

10.2. Ingredients and Additives in Processing

General Principle

The organic products are made of organic ingredients. The medium for the production/culturing of enzymes, dairy cultures, and other microbiological products shall contain organic ingredients.

Standard Requirements

- 10.2.1.** All the ingredients used in organic processing shall be organic in nature. The organic quality of ingredients shall be confirmed by the Conformity Assessment Body before use. The criteria for acceptance of products as organic are the same technical criteria as for products to bear the Bhutan Organic Mark, as defined by the NCOA. In circumstances where an ingredient of organic agriculture origin is not available in sufficient quality or quantity, the Conformity Assessment Body shall authorise the use of non-organic raw materials subject to periodic review and re-evaluation. However, non-organic raw material shall not be genetically engineered.
- 10.2.2.** Water and salt may be used in organic products and their quantities will not be used in calculating the organic ingredient content percentage.
- 10.2.3.** The use of isolated ingredients like minerals, trace elements, vitamins and similar ingredients is restricted to cases where it is legally required or where severe dietary or nutritional deficiency is proved scientifically.
- 10.2.4.** The microbial preparations and enzymes commonly used in food processing may be used but these microbial cultures shall be grown or multiplied or cultured by using ingredients

of organic agriculture origin. Genetically engineered microbial cultures or their products are not permitted.

10.2.5. The use of nanomaterial is prohibited in organic production and processing including packaging and product contact surfaces.

10.2.6. Organic processing never uses the same ingredient in both organic and non-organic form in a single product.

10.2.7. During processing of food, feed or fodder, only additives and processing aids that are listed in Appendix 5 (Table 1, 2, 3 and 5) can be used.

10.3. Processing Methods

General Principle

The aim of processing organic food is to keep its nutritional quality intact. Processing should be meticulously chosen so as to limit the use of non-organic ingredients and processing aids.

Standard Requirements

10.3.1. The techniques used for processing organic food shall be biological, physical, and mechanical in nature. Irradiation is not permitted.

10.3.2. Solvents used for extraction of organic products shall be either organically produced or food grade substances mentioned in Appendix 5 (Table 1 or 2).

10.3.3. Filtration equipment shall not contain asbestos or utilise techniques or substances that may negatively affect the product.

10.4. Pest and Disease Control

General Principle

Adopting Good Manufacturing Practices (GMP), including with regards to cleaning, sanitation and hygiene, is key to protect the product from pest and diseases in postharvest operations.

Standard Requirements

10.4.1. For pest management and its control, the following measures shall be used:

- a. Preventive methods such as disruption and elimination of habitat and access to facilities;
- b. Mechanical, physical and biological methods such as barriers, sound, ultra-sound, light, UV-light, temperature control, and controlled atmosphere;
- c. Pesticidal substances listed in the appendices of this standard;
- d. Other substances used in traps, e.g. pheromones and static bait traps.

Irradiation, fumigation with ethylene oxide, methyl bromide, aluminum phosphide or other substances is prohibited.

10.4.2. If the above measures are not effective and other measures must be used, there shall never be direct or indirect contact between organic products and prohibited substances (e.g. pesticides).

10.4.3. Persistent or carcinogenic pesticides and disinfectants are not permitted.

10.5. Packaging

General Principle

The packaging materials should not contaminate the organic product. Emphasis should be on eco-friendly, reusable, and recyclable packaging materials.

Standard Requirements

10.5.1. To prevent contamination of organic products, the reuse of package materials previously used for storing synthetic chemicals is prohibited.

10.6. Labelling

General Principle

Labelling shall convey clear and accurate information about the organic status of the product.

Standard Requirements

10.6.1. The label shall provide details of the person or company legally responsible for the production or processing of the product as well as the name of the Conformity Assessment Body.

10.6.2. All ingredients of a multi-ingredient product shall be listed on the label in order of their weight percentage. It shall be

apparent which ingredients are of organic origin (as defined in 10.2.1) and which are not. All additives shall be listed with their full name. If herbs and/ or spices constitute less than 2 % of the total weight of the product, they may be listed as “spices” or “herbs” without stating the percentage.

10.6.3. Whenever the product contains certain ingredients (including additives) which are not of organic origin, the labelling may be done as follows:

- a. Organic label may be used for products wherein a minimum of 95% (wt) of the ingredients are of organic origin.
- b. Where the ingredients of organic origin comprise less than 95% but not less than 70% (wt), products may not be called "organic". The word "organic" may be used on the principal display in statements like "made with organic ingredients" provided there is a clear statement of the proportion of the organic ingredients.
- c. Where less than 70% of the ingredients (by weight) are organic, the product cannot be labelled as “organic”, nor bear phrases such as “made with organic ingredients” on the package front, nor bear any certification body seal, national logo, or other identifying mark which represents

organic certification of a product or product ingredients, but individual ingredients may be called “organic” in the ingredients list.

- 10.6.4.** In the percentage calculations of organic ingredients, the water and salt that is added to the product shall not be included.
- 10.6.5.** The label for conversion products shall be clearly distinguishable from the label for organic products.
- 10.6.6.** Ingredients or products derived from wild production shall be declared as ‘products of wild production’.

11. Social Welfare

General Principle

The labour law in the country will be adhered to organic operations on farm or related work sites in the organic sector. Where national labour law does not cover situations, International Labour Organization's Declaration on Fundamental Principles and rights at Work will be followed.

Standard Requirements

- 11.1.** Organic operations shall ensure that employees and contracted workers have the freedom to associate, the right to organise and the right to bargain collectively.
- 11.2.** Organic operations shall provide all employees and contractors with equal opportunities and do not subject them to discrimination.
- 11.3.** Organic operations shall not violate human rights and shall provide fair working conditions for employees and contracted workers.
- 11.4.** Operators shall not use child labour, except that children are allowed to experience work on their family's farm or business or a neighbouring farm provided that:
 - a. such work is not dangerous or hazardous to their health and safety;

- b. it does not jeopardise the child's educational, moral, social, mental, spiritual and physical development;
- c. children are supervised by adults or have authorisation from a legal guardian.

11.5. Other issues except mentioned above will be taken care by the “Labor and Employment Act of Bhutan”, 2007.

12. Appendices

APPENDIX 1: CRITERIA FOR SUBSTANCES USED IN ORGANIC PRODUCTION AND PROCESSING

The main objective of setting criteria for evaluating inputs in organic production and processing is primarily to facilitate the equivalence assessment of substance allowed in organic agriculture (crop, livestock, processing). Based on the IFOAM NORMS for organic production and Processing (2014), there are six criteria to evaluate the inputs used in organic production and processing namely: Necessity and Alternatives, Sources and Manufacturing Process, Environment, Human Health, and Social, Economic, & Ethical Considerations.

A. General Criteria

All substances used in organic production and processing should meet the following criteria:

1. Use of the substance is consistent with the principles and objectives of organic agriculture.
2. The substance is necessary/essential for its intended use.
3. The manufacture, use and disposal of the substance does not result in, or contribute to harmful effects of environment.
4. The substance has lowest negative impact on human or animal health or environment when compared to alternative sources.

B. Crop and Livestock Criteria

1. *Necessity and Alternative*

It is very crucial to document the necessity of particular substance used in organic production and also the availability of alternative inputs, methods and practices.

- 1.1. The inputs used should ensure sufficient production in terms quantity & quality, improve and maintain soil quality (including nutrient recycling, enhance biological activity), address crop and livestock pest and diseases (including parasites).
- 1.2. A given substance shall be evaluated with reference to other available inputs/practices that may be used as alternatives to the substance.
- 1.3. Every input shall be evaluated in the context in which the product will be used (crop, volume, frequency of application, and specific purpose).

2. *Sources and Manufacturing Process*

- 2.1. Biological substances require a description of source organism(s) and shall not be genetically engineered.
- 2.2. Natural non-renewable resources e.g. mined minerals require description of deposit or occurrence in nature. Non-renewable resources may be used as supplements despite the fact that they are generally restricted and limited in their use.

- 2.3. Inputs that are extracted, recovered, or manufactured by means that are environmentally destructive may be restricted or prohibited.

3. Environment

The environmental impacts of inputs/substances shall be well-documented:

- 3.1. Parameters like acute toxicity, persistence, degradability, areas of concentrations, biological, chemical, and physical interactions with the environment, including known synergistic effects with other inputs used in organic production.
- 3.2. Effect of inputs/substances on the agro-ecosystem (soil health, soil organism, soil structure & soil fertility and crop & livestock) shall be well-documented including crop production inputs' impact on livestock and wildlife.
- 3.3. Substances with high salt indexes, measured toxicity to non-target organisms, and persistence adverse effects may be prohibited or restricted in their use.

4. Human Health

- 4.1. Substances/inputs reported to have adverse effects may be prohibited or restricted in their use to reduce potential risks to human health.

- 4.2. It is essential to document any human (e.g. workers, farmers, neighbours and consumers) who have been involved in extracting, manufacturing, application or handling of the inputs/substance, exposure through its release into the environment and ingestion of food-borne residues.

5. *Quality*

- 5.1. The impact of the inputs/substances on the product quality shall be well-documented

6. *Social, Economic, & Ethical considerations*

- 6.1. The inputs/substances' social, economic, and cultural implications shall be well documented.
- 6.2. Consumer perceptions (including general opinion) of the compatibility of inputs shall be taken into account and respected.
- 6.3. Inputs used for animal feed and livestock production shall be evaluated for their impact on animal health, welfare, and behavior.

C. Processing and Handling Criteria

The criteria shall be applied to evaluate additive and processing aids. The substances/inputs shall be essential to maintain/improve human health, environmental safety, animal welfare, product quality, production efficiency, consumer acceptance, ecological protection, biodiversity or landscape.

1. Necessity and Alternatives

- 1.1. A substance is considered essential if a processed product requires that substance in order to meet the established standards of identity, governmental regulations, or widely accepted consumer expectation.
- 1.2. Technical feasibility of the following alternatives shall be taken into consideration:
 - i. Whole products that are organically produced according to the standard.
 - ii. Products that are organically produced and processed according to the standard.
 - iii. Purified products of raw materials of non-agricultural origins, e.g. salt.
 - iv. Purified products of raw materials of an agricultural origin that have not been organically produced and processed according to the standard but appear on Appendix.

- 1.3. If an ingredient is required to manufacture a processed product to independently established minimum technical specifications recognised by consumers, and no organic substitute is available, then a non-organic ingredient may be deemed essential.
- 1.4. A given additive, processing aid, or carrier shall be evaluated with reference to other available ingredients or techniques that may be used as alternatives to the substance.

2. Sources and Manufacturing Process

- 2.1. Additives and processing aids from biological sources (e.g. fermentation cultures, enzymes, flavors, and gums) must be derived from naturally occurring organisms by the use biological, mechanical, and physical methods. Non-organic forms are allowed in organic products on if there are no organic sources.
- 2.2. The documentation shall meet the Food Chemical Codex specifications for natural contaminants such as heavy metals, radioactive isotopes, and salinity, and may be prohibited or restricted based on unacceptable levels of contaminations.

- 2.3. Synthetic nature-identical products that are not available in sufficient quantities and qualities in their natural form may be allowed provided other criteria are satisfied.

3. Environment

- 3.1. The impact of inputs/substances on environment shall be well-documented.
- 3.2. Additives and processing aids that result in toxic by-products or polluting waste may be restricted or prohibited.

4. *Human Health*

- 4.1. The impact of substances on human health shall be well-documented.
- 4.2. Substances reported to have adverse effects may be prohibited or restricted in their use to reduce potential risks to human health.
- 4.3. Processing aids and additives evaluated by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) of the Codex Alimentarius shall be considered.
- 4.4. It is essential to document any human (e.g. workers, farmers, neighbors and consumers) who are engaged in extracting, manufacturing, application or handling of the

inputs/substance, exposure through its release into the environment and ingestion of food-borne residues.

5. Quality (In processed products)

- 5.1. The effect of inputs/substances on overall product quality shall be well documented.
- 5.2. It is important to maintain the nutritional and overall quality of the product and shall not be detracted except if replacement of nutrients is required by law.
- 5.3. Each additive shall be evaluated with respect to its specific uses and applications without preference for any specific techniques or equipment, and shall be added to the list only when it is demonstrated to be absolutely essential and necessary for the formulation and production of a specific product that is consistent with organic principles stated in the IFOAM Standard.

6. *Social, Economic, & Ethical considerations*

- 6.1. The social, economic and cultural implications shall be documented (refer IFOAM Norms).
- 6.2. The inputs/substances shall not have negative impact on environment and human health
- 6.3. Consumer's perception and general opinion shall be respected.

APPENDIX 2: FERTILISERS AND SOIL CONDITIONERS

Substances Description, Compositional Requirements	Conditions for use
I. Plant and Animal Origin	
Farmyard manure, slurry and urine	Shall not constitute the main source of nitrogen in the absence of complimentary and additional nitrogen generating practices on farm and shall not be from conventional intensive livestock production systems without prior permission from the control body.
Guano	
Vermicastings	
Blood meal, meat meal, bone, bone meal	Without preservatives
Hoof and horn meal, feather meal, fish and shell products, wool, hide, fur, hair, dairy products	Without preservatives
Biodegradable processing by-products, plant or animal origin, e.g. by-products of food, feed, oilseed, brewery, distillery or textile processing	Free of significant contaminants; or composted before bringing onto organic land and confirmed free of significant contaminants.
Crop residues and plant materials, mulch, green manure, straw	
Wood, bark, sawdust, wood shavings, wood ash, wood charcoal, biochar	Only if not chemically treated
Seaweed and seaweed products bio char	As far as obtained by: (i) physical processes including dehydration, freezing and grinding; (ii) extraction with water or potassium hydroxide solutions, provided that the

Substances Description, Compositional Requirements	Conditions for use
	minimum amount of solvent necessary is used for extraction; (iii) fermentation.
Peat (prohibited for soil conditioning)	Excluding synthetic additives; permitted only horticulture (floriculture, nursery plants and potting mixes).
Plant preparations and extracts. e.g. liquid manure	
Compost made from ingredients listed in this appendix	
Spent mushroom waste, humus from worms and insects	
Urban compost and household wastes from separated sources which are monitored for contamination	
Silage and silage extract	Without ammonium
Leaf mould from natural forest	
Bio fertilisers	
II. Mineral Origin	
Calcareous and magnesium amendments: a. Limestone, gypsum, marl, chalk, sugar beet lime, b. Magnesium rock, kieserite and Epsom salt(magnesium sulphate) c. Other non-synthetic calcareous and magnesium amendments	
Clay (e.g. bentonite,perlite,vermiculite, zeolite)	
Mineral potassium (e.g. sulphate of potash, muriate of potash, kainite, sylvanite, patenkali)	Shall be obtained by physical procedures but not enriched by chemical processes
Phosphates in non-synthetic form (e.g.	Cadmium content less than or

Substances Description, Compositional Requirements	Conditions for use
rock phosphate, colloidal phosphate, apatite)	equal to 90 mg/kg of P ₂ O ₅
Sodium Chloride	
Sulphur	
<p>Trace elements, e.g.:</p> <ul style="list-style-type: none"> a. Boric acid, sodium borate, calcium borate, borethanolamin, b. Cobalt-acetate, cobalt-sulphate, c. Copper oxide, copper sulphate, copper hydroxide, copper silicate, copper carbonate, copper citrate d. Ferric oxide, ferric sulphate, ferrous sulphate, iron citrate, iron sulphate, or iron tartrate e. Manganous oxide, manganese sulphate and magnesium carbonate f. Selenic acid, selenous acid g. Sodium molybdate, molybdic oxide h. Zinc carbonate, zinc oxide, zinc silicate, and zinc sulphate 	<p>Use restricted to cases where soil/plant nutrient deficiency is documented by soil or tissue testing or documented by soil or tissue testing or diagnosed by an independent expert.</p> <p>Micronutrients in either chloride or nitrate forms are prohibited.</p> <p>Micronutrients may not be used as a defoliant, herbicide, or desiccant.</p>
III. Microbiological	
Biodegradable processing by-products of microbial origins. e.g. by-products of brewery or distillery processing	
Microbiological preparations based on naturally occurring organisms	
IV. Others	
Biodynamic preparations	
Calcium lignosulphonate	

APPENDIX 3: CROP PROTECTANTS AND GROWTH REGULATORS

Substances Description, Compositional Requirements	Conditions for use
I. Plant and Animal Origin	
Algal preparations	As far as obtained by: (i) physical processes including dehydration, freezing and grinding; (ii) extraction with water or potassium hydroxide solutions, provided that the minimum amount of solvent necessary is used for extraction; (iii) fermentation
Animal preparations and oils	
Beeswax	
Chitin nematicides (natural origin)	Not processed by acid hydrolysis
Coffee grounds	
Corn gluten meal	
Dairy products (e.g.milk, casein)	
Gelatine	
Lecithin	
Natural acids (e.g. vinegar)	
Neem (<i>Azadirachta indica</i>)	
Plant oils	
Plant based repellents	
Propolis	
Pyrethrum (<i>Chrysanthemum cinerariaefolium</i>)	The synergist piperonyl butoxide is prohibited
<i>Quassia (Quassia amara)</i>	

Substances Description, Compositional Requirements	Conditions for use
Rotenone (<i>Derris elliptica</i> , <i>Lonchocarpus spp.</i> <i>Tephrosia spp.</i>)	Not near waterways. Subject to approval by the Conformity Assessment Body.
<i>Ryania</i> (<i>Ryania speciosa</i>)	
Sabadilla	
II. Mineral Origin	
Chloride of lime (calcium chloride)	
Clay (e.g. bentonite, perlite, vermiculite, zeolite)	
Copper salts (e.g. sulphate, hydroxide, oxychloride, octanoate)	Maximum 6 kg Cu/ha per year (on a rolling average basis)
Diatomaceous earth	
Light mineral oils (paraffin)	
Lime sulphur (calcium polysulphide)	
Potassium bicarbonate	
Calcium hydroxide (hydrated lime)	For application on aerial plant parts only
Silicates (e.g. sodium silicates, quartz)	
Sodium bicarbonate	
Sulphur	
III. Microorganisms	
Fungal preparations (e.g. spinosad)	
Bacterial preparations (e.g. <i>Bacillus thuringiensis</i>)	
Release of parasites, predators and sterilised insects	
Viral preparations (e.g. granulosis virus)	
IV. Others	
Biodynamic preparations	
Carbon dioxide	Shall not be result of

Substances Description, Compositional Requirements	Conditions for use
	burning fuel solely to produce carbon dioxide; allowed only as by-product of other processes.
Ethyl alcohol	
Homeopathic and ayurvedic preparations	
Iron phosphates (for use as molluscicide)	
Sea salt and salty water	
Soft soap (potassium soap)	
V. Traps, barriers, repellents	
Physical methods (e.g.chromatic traps, mechanical traps)	
Mulches, nets	
Pheromones- in traps and dispensers only	

APPENDIX 4: SUBSTANCES FOR USE IN LIVESTOCK PRODUCTION

Substances allowed for use in organic livestock production.

The following substances may be allowed to be used in organic livestock production under the recommendations of a qualified veterinarian;

(A) As disinfectants, sanitiser, and medical treatments as applicable:

1. Alcohols.
 - i. Ethanol-disinfectant and sanitiser only, prohibited as a feed additive.
 - ii. Isopropanol-disinfectant only.
2. Aspirin- (for health care use to reduce inflammation).
3. Atropine (restricted use and used as per the recommendations of a veterinarian)
 - i. A meat withdrawal period of at least 56 days after administering to livestock intended for slaughter; and a milk discard period of at least 12 days after administering to dairy animals.
4. Biologics—Vaccines.
5. Butorphanol (restricted use and used as per the recommendations of a veterinarian).

- i. A meat withdrawal period of at least 42 days after administering to livestock intended for slaughter; and a milk discard period of at least 8 days after administering to dairy animals.
6. Chlorhexidine—allowed for surgical procedures conducted by a veterinarian. Allowed for the use as a teat dip when, alternative germicidal agents and/or physical barriers have lost their effectiveness.
7. Chlorine materials—disinfecting, sanitising facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit as approved by the Royal Government of Bhutan.
 - i. Calcium hypochlorite.
 - ii. Chlorine dioxide.
 - iii. Sodium hypochlorite.
8. Electrolytes—without antibiotics.
9. Flunixin (after recommendations from a veterinarian).
10. Furosemide (after recommendations from a veterinarian).
11. Glucose.
12. Glycerine—Allowed as a livestock teat dip, must be produced through the hydrolysis of fats or oils.
13. Hydrogen peroxide.
14. Iodine.
15. Magnesium hydroxide.
16. Magnesium sulphate.

17. Oxytocin-use in post-parturition therapeutic applications and used after recommendations from a veterinarian.
18. Parasiticides-prohibited in slaughter stock, allowed in emergency treatment for dairy and breeder stock when organic system plan-approved preventive management does not prevent infestation. Milk or milk products from a treated animal cannot be labelled as organic for 90 days following treatment. In breeder stock, treatment cannot occur during the last third of gestation if the progeny will be sold as organic and must not be used during the lactation period for breeding stock.
 - i. Fenbendazole.
 - ii. Ivermectin.
 - iii. Moxidectin-for control of internal parasites only.
19. Peroxyacetic/peracetic acid-for sanitising facility and processing equipment.
20. Phosphoric acid—allowed as equipment cleaner, provided that, no direct contact with organically managed livestock or land occurs.
21. Poloxalene (only be used for the emergency treatment of bloat).
22. Tolazoline

- i. Use only to reverse the effects of sedation and analgesia caused by Xylazine.
- ii. A meat withdrawal period of at least 8 days after administering to livestock intended for slaughter; and a milk discard period of at least 4 days after administering to dairy animals.

23. Xylazine

- i. used under emergency situations
- ii. A meat withdrawal period of at least 8 days after administering to livestock intended for slaughter; and a milk discard period of at least 4 days after administering to dairy animals.
- iii. Strychnine (non-synthetic substances) may not be used in organic livestock production.

(B) For topical treatment (external parasiticide or local anesthetic as applicable).

1. Copper sulphate.
2. Iodine.
3. Lidocaine-as a local anesthetic. Use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
4. Lime, hydrated-as an external pest control, not permitted to cauterize physical alterations or deodorise animal wastes.
5. Mineral oil—for topical use and as a lubricant.
6. Procaine—as a local anesthetic, use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
7. Sucrose octanoate esters (Shall not be used as feed supplements but can be used as feed additives).

(C) Feed supplements

1. Trace minerals, used for enrichment or fortification.
2. Vitamins, used for enrichment or fortification.

APPENDIX 5 –TABLE 1: LIST OF APPROVED ADDITIVES

International Numbering System	Product	Limitations
INS 170	Calcium carbonate	Not for colouring
INS 220	Sulfur dioxide	Only for wine
INS 224	Potassium metabisulphate	Only for wine
INS270	Lactic Acid	
INS290	Carbon dioxide	
INS296	L-malic acid	
INS300	Ascorbic Acid	
INS 306	Tocopherols, mixed natural concentrates	
INS322	Lecithin	Obtained without using bleaches
INS 330	Citric acid	
INS 331	Sodium citrates	
INS 332	Potassium citrates	
INS333	Calcium citrates	
INS334	Tartaric acid	Only for wine
INS335	Sodium tartarate	
INS 336	Potassium tartrate	
INS 341	Mono calcium phosphate	Only for raising flour
INS342	Ammonium phosphate	Restricted to 0.3gm/l in wine
INS 400	Alginic acid	
INS 401	Sodium alginate	
INS 402	Potassium alginate	
INS 406	Agar	

International Numbering System	Product	Limitations
INS 407	Carrageenan	
INS 410	Locust bean gum	
INS 412	Guar gum	
INS413	Tragacanth gum	
INS414	Arabic gum	
INS415	Xantha gum	
INS440	Pectin	Unmodified
INS500	Sodium carbonates	
INS 501	Potassium carbonates	
INS 503	Ammonium carbonates	Only for cereal products, confectionary, cakes and biscuits
INS 504	Magnesium carbonate	
INS 509	Calcium chloride	
INS 511	Magnesium chloride	Only for soybean products
INS 513	Sulphuric acid	As processing aid for pH adjustment of water during sugar processing. As additive for wine and apple cider production
INS 516	Calcium sulphate	For soybean products, confectionery and in bakers' yeast
INS 517	Ammonium sulphate	Only for wine, restricted to 0.3mg/l
INS 524	Sodium hydroxide	For sugar processing and for surface

International Numbering System	Product	Limitations
		treatment of traditional bakery products
INS 526	Calcium hydroxide	Food additive for maize tortilla flour
INS 938	Argon	
INS 941	Nitrogen	
INS 948	Oxygen	

APPENDIX 5- TABLE 2: PROCOCESSING AIDs

Products	Condition for use
Water	Potable water standards
Calcium chloride	Coagulant agent
Calcium carbonate	Coagulant agent
Calcium hydroxide	Processing aid for sugar
Calcium sulphate	Coagulant agent
Magnesium chloride	Coagulation agent
Potassium carbonate	Drying of grape raisins
Sodium carbonate	Sugar production
Lactic acid	For regulation of pH of brine bath in cheese production
Citric acid	For regulation of pH of brine bath in cheese production; oil production and hydrolysis of starch
Sodium hydroxide	As processing aid for pH adjustment of

Products	Condition for use
	water during sugar processing.
Sulphuric acid	As processing aid for pH adjustment of water during sugar processing.
Hydrochloric acid	Gelatine production, regulation of pH in brine bath in Gouda Processing
Ammonium hydroxide	pH enhancement of meat & poultry product
Hydrogen peroxide	
Carbon dioxide	Foaming & carbonating agent
Oxygen	
Nitrogen	Foaming agent & packing gas
Ethanol	Solvent
Tannic acid	Filtration aid for wine
Egg white albumin	Used in wine only as clarifying agent
Casein	Clarifying agent for wine
Gelatin	as emulsifier & clarifying agent in wine, Milk product, fruit & vegetable
Isinglass	Wine Only
Vegetable oils	Greasing or releasing agent, anti-foaming agent
Silicon dioxide	As gel or colloidal solution, as anti-caking agent used in wine dehydrated

Products	Condition for use
	fruit & vegetable
Activated carbon	only from vegetative source as filtration aid
Talc	In compliance with the specific purity criteria for food additive
Citric acid	pH adjustment for sugar processing
Diatomaceous earth	Gelatin production
Perlite	Gelatin production
Beewax	Releasing agent
Carnauba wax	Releasing agent
Tartaric acid and salts	Wine only
Sodium carbonates	Sugar production
Preparations of bark components	only for sugar
Potassium hydroxide	pH adjustment for sugar processing
Malic acid	As acidulent in Fruit/Vegetable product & milk product.
Lecithin	Obtained without bleaches
Oxygen	
Cellulose	Gelatin production
Kaolin	Filtering aid & extraction of Propolis
Ethylene	De-greening of citrus and ripening

Products	Condition for use
Isinglass	Only for wine
Tricalcium phosphate	Free flow aid in powdered salt
Ammonium bicarbonate	leavening agent in certain cookies and crackers.
	It provides the characteristic texture as well as functions in controlling
	Cookie spread. During the baking process, the ammonium bicarbonate decomposes and is no longer present in the baked good

APPENDIX 5- TABLE 3a: FLAVOURING AGENTS

Sl.No.	Flavoring agent
1	Organic flavoring extracts
2	Volatile (essential produced by means of solvents such as oil, water, ethanol, carbon dioxide and mechanical and physical processes)
3	Natural Smoke Flavour.
4	Natural flavoring preparations approved by the Conformity Assessment Body (Criteria: the source is plant, animal or mineral; the process of production in line with organic standards; produced by means of solvents like vegetable oils, water ethanol, carbon dioxide and

	mechanical and physical processes)/ defined in General Requirements for natural flavorings (CAC/GL 29-1987)
--	---

APPENDIX 5- TABLE 3b: OTHERS

Sl.No	Other Items
1	Drinking Water
2	Salt (With sodium chloride or potassium chloride as basic components generally used in food processing
3	Minerals (including trace elements),vitamins, essential fatty and amino acids, and other nitrogen compound where their use is legally required or where sever dietary or nutritional deficiency can be demonstrated

APPENDIX 5- TABLE 4: INDICATIVE LIST OF EQUIPMENT CLEANSERS AND DISINFECTANT

Product	Condition
Acetic acid	Food Grade Glacial Acetic Acid can also be used for cleaning equipment in milk and food processing plants.
Alcohol(Ethyl)	Allowed as disinfectant
Alcohol Isopropyl	May be used as a disinfectant under restricted conditions.
Calcium hydroxide	
Calcium hypochlorite	An intervening event or action must occur to eliminate risks of contamination.
Calcium oxide	
Chloride of lime	
Citric acid	
Formic acid	
Hydrogen peroxide	Allowed as a water and surface disinfectant.
Lactic acid	
Natural essences of plants	
Oxalic acid	
Ozone	Through its action as an oxidizer, provides comparable disinfection

Product	Condition
	power to chlorine.
	On-site generation due to instability of the compound.
Peracetic acid	For use in wash and/or rinse water according to FDA limitations. For use as a sanitiser on food contact surfaces.(CAS # 79–21–0)
Phosphoric acid	Only for dairy products That, no direct contact with organically managed livestock or land occurs.
Plant extracts	
Potassium soap	An intervening event or action must occur to eliminate risks of contamination.
Sodium carbonate	
Sodium hydroxide (caustic soda)	An intervening event or action must occur to eliminate risks of contamination.
Sodium hypochlorite as liquid Bleach	Sanitiser for water and food contact surfaces. Product (fresh produce) wash water treated with chlorine compounds as a disinfectant.

Product	Condition
Chlorine dioxide	Cannot exceed 4ppm (mg/L) residual chlorine measured downstream of product contact.
Sodium soap	An intervening event or action must occur to eliminate risks of contamination.
Iodine	Non elemental not to exceed 5% solution

APPENDIX 5- TABLE 5 : PREPARATION OF MICRO-ORGANISMS AND ENZYMES IN FOOD PROCESSING

Sl.No	Micro-organisms and Enzymes
1	Organic certified micro-organism
2	Preparations of micro-organisms accepted for use in food processing
3	Micro-organisms- any food grade bacteria, fungi, and other micro-organism
4	Genetically Modified Organisms (GMO) are excluded
5	Baker's yeast produced without bleaches and organic solvent
6	Inorganic yeast may be used when organic yeast is not commercially available
7	Yeast—non synthetic, growth on petrochemical substrate and sulphite waste liquor is prohibited.
8	Enzymes—must be derived from edible, non-toxic plants, non-pathogenic fungi, or non-pathogenic bacteria
9	Animal enzymes-(Rennet-animals derived; Catalase—bovine liver; Animal lipase; Pancreatin; Pepsin; and Trypsin).
10	Hop for fermentation
1 and 2: Use with approval from Conformity Assessment Body	

. Contributors to BOS Version 2022

Name	Designation	Agency
Kesang Tshomo	Programme Manager	NOFP-CU
Tirtha Bdr.Katwal	Programme Director/Specialist II	NCOA-Yusipang
Kailash Pradhan	Programme Officer/Specialist II	NCOA-Yusipang
Tshering Zam	Deputy Chief Agriculture Officer	NCOA-Yusipang
Ganga Maya Rizal	Principal Feed and Fodder Production Officer	DoL
Dr. MP Timsina	Advisor/ Specialist II	DoL
Jigme Wangdi	Specialist II	DoL
Tashi Dendhup	Deputy Chief Livestock Production Officer	DoL
Sonam Yonten	Sr. Regulatory and Quarantine Inspector	BAFRA
Kinga Lham	Sr. Agriculture Supervisor	NCOA-Yusipang
Norbu	Sr. Mushroom Supervisor	NMC
Pema Zangmo	Sr. Agriculture Supervisor	NCOA-Yusipang
Dawa Dem	Horticulture Officer	NCOA-Yusipang
Kencho Namgyal	Sr. Agriculture Supervisor	NCOA-Yusipang
Om Prakash Ghalley	Deputy Chief. Agriculture Officer	NCOA-Yusipang

Bhutan Organic Standard (BOS)

Published by National Centre for Organic Agriculture (NCOA)

Department of Agriculture, Thimphu

©2022

Ministry of Agriculture and Forests

Phone No: +975 77191124, 77191125, 77191126

www.ncoa.gov.bt

Printing supported by: RMS Initiative, ICIMOD

ICIMOD