



## forestry, fisheries & the environment

Department:  
Forestry, Fisheries and the Environment  
**REPUBLIC OF SOUTH AFRICA**

# Standard Operating Procedure: Feed Sampling and Handling

Branch: Fisheries Management  
Chief Directorate: Aquaculture Development and Freshwater Fisheries  
Directorate: Sustainable Aquaculture Management

Issue 2: July 2024

**TITLE**

Standard Operating Procedure: Feed Sampling and Handling

**COMMENCEMENT**

This Standard Operating Procedure comes into force on 1 August 2024.

**REVOCATION**

This programme issue revokes and replaces Standard Operating Procedure: Feed Sampling and Handling, Issue 1.

**STANDARD OPERATING PROCEDURES ISSUED**

Issue	Date of issue
1	1 April 2022

**ISSUING AUTHORITY**

This Standard Operating Procedure is issued by the Environmental Officer Specialised Production of the Directorate Sustainable Aquaculture Management of the Department of Forestry, Fisheries and the Environment in terms of the South African Aquacultured Marine Fish Monitoring and Control Programme.



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Environmental Officer Specialised Production

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## **1. DOCUMENT CONTROL**

The Standard Operating Procedure (SOP): Feed Sampling and Handling was compiled by Department Forestry, Fisheries and the Environment (DFFE): Food Safety Office (FSO) of the Directorate Sustainable Aquaculture Management. The SOP is administered by the FSO and will be reviewed and updated as relevant new information becomes available.

A detailed record of all amendments shall be maintained, and the latest version will be made available at the FSO and will be loaded onto the DFFE website ([www.environment.gov.za](http://www.environment.gov.za)). Suggestions for alterations that would significantly improve the document are welcomed. These should be forwarded to the coordinator, Environmental Officer Specialised Production, Mr John Foord and enquiries can be directed to Environmental Officer Production, Mr Mayizole Majangaza (Appendix 1).

## 2. SCOPE

This document covers the procedures for the sampling of feed required in terms of the Aquacultured Marine Fish Food Safety Programme (AMFFSP) and the National Residue Control Plan (NRCP) for banned veterinary medicine residues indicated in the NRCP. The SOP covers finfish and shellfish production areas located between Port Nolloth in the Northern Cape and Haga Haga in the Eastern Cape, South Africa that are monitored in terms of the AMFFSP and the NRCP. Samples intended for the official control of feed shall be taken according to the methods described below. Samples thus obtained shall be considered as representative of the sampled portions.

## 3. BACKGROUND

The Department of Forestry, Fisheries and the Environment (DFFE) is the managing and regulatory authority for the undertaking of aquaculture activities that include farming, harvesting and transporting of fish for wholesale trading stipulated in the permit conditions issued in terms of the Marine Living Resources Act, 1998 (Act No. 18 of 1998) and associated regulations. The Directorate: Sustainable Aquaculture Management (D: SAM) of the Fisheries Branch of DFFE is responsible for the development, management and regulation of a sustainable aquaculture industry that contributes towards job creation, food security, rural development and economic growth. D: SAM aims to achieve the above-mentioned strategic objectives through the development and implementation of relevant enabling legislation, policies and programmes as well as be responsive and compliant to international obligations and agreed standards. The Food Safety Office (FSO) within D: SAM is responsible for the development and management of food safety programmes stipulated in the permit conditions issued in terms of the Marine Living Resources Act, 1998 (Act No. 18 of 1998) including the AMFFSP and the associated National Residue Control Programme (NRCP). The objectives of the food safety programmes include providing guarantees to domestic and international markets and consumers that South African cultured fish products are safe for human consumption.

The risks to food safety of cultured fish include environmental residues (heavy metals, pesticides, polychlorinated biphenyl, dioxins, perfluoroalkyl substances, polycyclic aromatic hydrocarbons and radionuclides) and veterinary medicine residues (hormones, antibiotics and anthelmintics), the accumulation of biotoxins (Paralytic Shellfish Toxins (PST), Lipophilic Shellfish Toxins (LST) and Amnesic Shellfish Toxins (AST)) and microbiological contamination in shellfish indicated by the presence of *E. coli*. In some cases, as with oysters, thermal processes are not applied prior to sale to eliminate pathogens and therefore microbial multiplication is likely to occur. Marine biotoxins and residues are furthermore not eliminated by cooking.

The DFFE has appointed National Regulator for Compulsory Specifications (NRCS) to officially sample feed and fish from the marine aquaculture farms to monitor the food safety risks in the production areas. The samples are sent to laboratories approved by the Food Safety Office (FSO) for the testing of banned veterinary medicine residues. The test results are submitted to the Food Safety Office (FSO) of the Directorate Sustainable Aquaculture Management for the monitoring and control purposes.

#### 4. DEFINITIONS

**“Aggregate sample”** means an aggregate of incremental samples taken from the same sampled portion.

**“Container”** means, for the purposes of this document, a plastic bag.

**“Final sample”** means a part of the reduced sample that is submitted for analysis.

**“Incremental sample”** means a quantity taken from one point in the sampled portion that make up the aggregate sample must be collected at random from different representative places in the sampled portion and must all be more or less equal in size.

**“Laboratory sample”** means a final sample intended for the laboratory (as received by the laboratory)

**“Lot”** means an identified quantity of feed determined to have common characteristics, such as origin, variety, type of packaging, packer, consignor or labelling, and in case of a production process, a unit of production from a single plant using uniform production parameters or a number of such units, when produced in continuous order and stored together.

**“Retention sample”** means the final sample that is kept at the laboratory if required as defense for the facility that was sampled, should legal action be required.

**“Reduced sample”** means the aggregate sample after it has been thoroughly mixed into one homogenous sample.

**“Residue reference number”** means the sample reference number that is included in the National Residue Control programme.

**“Sampled portion”** means a lot or an identified part of the lot that will be sampled and that is of homogenous nature.

**“Sealed sample”**: a sample sealed in such a manner as to prevent any access to the sample without breaking or removing the seal.

## 5. COLLECTION OF SAMPLES

The objective of feed sampling is to ensure the exclusion of banned veterinary medicines from manufactured feed, whether added intentionally or unintentionally. Veterinary medicines may be incorporated into feed commercially (as a premix) during manufacturing or inadvertently through cross-contamination from previously manufactured batches. Additionally, veterinary medicines may be added intentionally or accidentally in feeds mixed by the farmer on the farm for their own use. Therefore, feed sampling must be representative of the entire feed lot, encompassing both commercial feed and home-mixed feeds.

The goal of representative sampling is to obtain a small fraction from a lot in such a manner that the analysis of any characteristic of this fraction will accurately reflect the mean value of the characteristic of the entire lot. The lot shall be sampled by repeatedly taking incremental samples from various single positions within the lot. These incremental samples shall be combined by mixing to form an aggregate sample, from which representative final samples will be prepared.

If, upon visual inspection, portions of the feed to be sampled exhibit a difference in quality from the remainder of the feed within the same lot, such portions shall be separated and treated as a distinct subplot. If it is not possible to divide the feed into separate sublots, the feed shall be sampled as a single lot. In such cases, this fact shall be documented in the sampling report.

### 5.1. General Provisions

1. Samples shall be taken by individuals authorized by the Competent Authority.
2. Samples must be taken and prepared without unnecessary delay, ensuring that the product remains unchanged and uncontaminated.
3. Sampling apparatus and containers must be clean and dry to prevent contamination and cross-contamination of the final sample.
4. Samples that are not transported to the laboratory by the official sampler must be sealed to prevent access without breaking or removing the seal. The seal mark should be clearly identifiable and visible. Alternatively, samples can be placed in a container that cannot be opened without irreversibly damaging the receptacle, thereby preventing reuse.
5. Samples must be indelibly marked and identified in a manner that provides an unambiguous link to the sampling report.
6. The method of feed sample collection must ensure no contamination or alteration of the sample content.

### 5.2. Sampling Method

Feed samples must be collected in the following way:

1. Randomly select the required number of units as indicated in Table 1 from the whole sampled portion for sampling.
2. Take the incremental sample from each of the selected units using a shovel and place it into a container to make up the aggregate sample of 4 kg. The incremental samples must be of approximately equal size.
3. Thoroughly mix the incremental samples in the container to make up the reduced sample (aggregate sample).
4. Subsample the final sample (500g) designated as the “laboratory sample” and place into a container (plastic bag) that is securely sealed and include the letter “L” on the container label.
5. Subsample the final sample (500g) designated as the “retention sample” and place into a container (plastic bag) that is securely sealed and include the letter “R” on the container label.
6. If the sample portion (Lot) consists of 20 bags or less, subsample the final samples (500g) directly from the selected feed bag.
7. The laboratory sample and the retention sample shall then be placed into a clearly labelled bag.

8. Should there be multiple lots of feed on the premises, each lot shall be sampled separately as indicated above.
9. The sample must be indelibly marked and must be identified in such a way that there is an unambiguous link to the sampling report.
10. The sample containers and the tamperproof bags will be provided by the officially appointed sampling body.
11. The tamperproof bags must be designed in such a way that the bag is damaged if opened.
12. Feed samples must be dispatched to the laboratory indicated on the National Residue Control Programme within one working day of sampling.
13. Each sample sent to the laboratory must be accompanied by the prescribed sample collection form (provided by the laboratory), which must be put in an envelope that is attached to the feed sample.
14. The Residue Sampling Report must be completed and submitted to the Food Safety Office.

*Table 1: number of units (bags) sampled from each sample portion*

<b>Size of sampled portion</b> (units) <sup>#</sup>	<b>Minimum number of units from which incremental sample is taken</b> (units) <sup>#</sup>
1 to 20	1
21 to 150	3
151 to 400	5
> 400	$\frac{1}{4}$ of the $\sqrt{\text{number of units making up the sampled portion}}$ , up to 40 units*

\* Where the number obtained is a fraction, it shall be rounded up to the next whole number.

<sup>#</sup> Feed that is packaged in bags is referred to in the table as units.

The minimum size of the aggregate sample, which is made up of the incremental samples indicated in the Table 1 above, shall be 4 kg.

The amount in the final samples designated as the laboratory sample and retention sample shall be not less than 500g.



## 6. REFERENCES

- Department of Forestry, Fisheries and the Environment. 2024 Aquacultured Marine Fish Food Safety Programme. Cape Town. Issue 8, 1-67.
- National Regulator for Compulsory Specifications. 2024. Procedure: Sampling and Transport of Aquacultured Marine Fish. Cape Town. Issue 2, 1-18.
- European Commission. 2009. Commission Regulation (EC) No 152/2009 of 27 January 2009 laying down the methods of sampling and analysis for the official control of feed. Annex I, 1-14.

**Appendix 1: Contact Information**

Food Safety Office

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Chief Directorate: Aquaculture Development and Freshwater Fisheries

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**Food Safety Office**

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## Scenario

A farm has three lots of feed (different types of feed). Lot A consists of 20 bags, Lot B consists of 350 bags and Lot C has 500 bags.

### Lot A

1. Randomly select 1 bag of feed
2. Sample 500 g of feed and place into a plastic bag and include the letter “A” to designate Lot A and the letter “L” to designate “Laboratory Sample” after the sample number for the e.g. “2022/FF/01 AL”.
3. Sample 500 g of feed and place into a plastic bag and include the letter “A” to designate Lot A and the letter “R” to designate “Retention Sample” after the sample number for the e.g. “2022/FF/01 AR”.
4. Place the two bags into a security bag and seal the bag.

### Lot B

1. Randomly select 5 bags of feed.
2. Take incremental samples of at least 800 g from each of the 5 feed bags and place into a mixing container to make up 4 kg ( $800\text{g} \times 5 = 4000\text{g}$ ) and thoroughly mix the feed in the mixing container.
3. Sub-sample 500 g of feed and place into a plastic bag and include the letter “B” to designate Lot B and the letter “L” to designate “Laboratory Sample” after the sample number for the e.g. “2022/FF/01 BL”
4. Sub-sample 500 g of feed and place into a plastic bag and include the letter “A” to designate Lot A and the letter “R” to designate “Retention Sample” after the sample number for the e.g. “2022/FF/01 BR”
5. Place the two bags into a security bag and seal the bag.

### Lot C

1. Randomly select 6 bags of feed (square root of the number of bags in the lot & divide by 4 & round up).
2. Take incremental samples of at least 667 g from each of the 6 feed bags and place into a mixing container to make up 4 kg ( $667\text{g} \times 6 = \text{aprox. } 4000\text{g}$ ) and thoroughly mix the feed in the mixing container.
3. Sub-sample 500 g of feed and place into a plastic bag and include the letter “C” to designate Lot C and the letter “L” to designate “Laboratory Sample” after the sample number for the e.g. “2022/FF/01 CL”
4. Sub-sample 500 g of feed and place into a plastic bag and include the letter “C” to designate Lot C and the letter “R” to designate “Laboratory Sample” after the sample number for the e.g. “2022/FF/01 CR”
5. Place the two bags into a security bag and seal the bag.