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**IFFO RS**  
Global Standard for Responsible Supply  
of Marine Ingredients

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# Global Standard for Responsible Supply of Marine Ingredients Fishery Assessment Methodology and Template Report V2.0



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<b>Fishery Under Assessment</b>	<b>Japanese pilchard <i>Sardinops sagax</i> FAO 61 (synonym <i>S. melanostictus</i>)</b>
<b>Date</b>	<b>June 2019</b>
<b>Assessor</b>	<b>Jim Daly</b>

Application details and summary of the assessment outcome				
<b>Name: T. C. Union Agrotech Co. Ltd</b>				
<b>Address:</b>				
<b>Country: Thailand</b>		<b>Zip:</b>		
<b>Tel. No.:</b>		<b>Fax. No.:</b>		
<b>Email address:</b>		<b>Applicant Code</b>		
<b>Key Contact:</b>		<b>Title:</b>		
Certification Body Details				
<b>Name of Certification Body:</b>		<b>SAI Global Ltd</b>		
<b>Assessor Name</b>	<b>Peer Reviewer</b>	<b>Assessment Days</b>	<b>Initial/Surveillance/Re-approval</b>	<b>Whole fish/ By-product</b>
Jim Daly	Virginia Polonio	0.5	Re-approval	By-product
<b>Assessment Period</b>	2018			

Scope Details	
<b>Management Authority (Country/State)</b>	Japan
<b>Main Species</b>	<i>Sardinops sagax</i> synonym <i>S. melanostictus</i>
<b>Fishery Location</b>	FAO 61
<b>Gear Type(s)</b>	Purse seines, Boat seines
Outcome of Assessment	
<b>Overall Outcome</b>	Pass
<b>Clauses Failed</b>	None
<b>Peer Review Evaluation</b>	Approve
<b>Recommendation</b>	Pass

### Assessment Determination

This species is known under a variety of common names and around Japan: is more commonly known as Japanese sardine *Sardinops sagax* and also under the synonym *S. melanostictus*.

There are two stocks Pacific Ocean stock and the Tsushima Warm Current Stock. Both stocks are assessed separately but managed together under a single TAC for combined stocks. Annual stock assessment is undertaken by the Central Fisheries Research Institute of Japan's Fisheries Research Agency (FRA). The Pacific stock spawns from November-June from Shikoku to the Kanto region, while the Tsushima stock spawns January-June from around Nagasaki to Toyama prefecture.

The latest stock assessment information available is from 2017 (**R1**). Reference points are defined for the stock. There is an increasing trend in the parent stock over the last 5 years (2012-2017). Total stock was estimated at 3.2 million tonnes in 2017. A 'Blimit' reference point of 221,000 tonnes for SSB has been established. The most recent estimate of SSB was 891,000 tonnes, well above Blimit.

FRA stock assessments do not include official target reference points but mention a management goal of maintaining current SSB.

Both stocks are subject to species-specific management and assessed under clause C. Fishery removals are included in the stock assessment process and the stocks are considered, in their most recent assessment, to have a biomass above the limit reference point (or proxy) so they are considered to pass clause C.

Japanese sardine is classed as of least concern on the IUCN Red List of Threatened Species and is not listed on CITES (accessed 24.06.19).

**Japanese sardine in FAO 61 is recommended for approval as by-product material under the IFFO RS Standard v 2.0**

### Peer Review Comments

PR agrees with the conclusions raised in the report. Both stocks are assessed every year and are managed by total allowable catch (TAC). The TAC has only been exceeded once since the system was implemented in 1997 and catches are monitored by The Fisheries Research and Education Agency of Japan (FRA) who conducts the stock assessment. In the last report, there was no high abundance level of biomass shown but the Japanese Pacific stock is above its limit reference point and appears to be increasing in recent years. A good amount of information about the fishery and relevant ecosystems is publicly available.

PR agrees with the approval of this by-product.

### Notes for On-site Auditor

## Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)
Category A			A 1
			A 2
			A 3
			A 4
Category B			
Category C	<i>Sardinops sagax</i> (synonym <i>S. melanostictus</i> )	NA	<b>Pass</b>
Category D			

[List all Category A and B species. List approximate total %age of landings which are Category C and D species; these do not need to be individually named here]

## HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

### Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for **each** Category A species.
4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** of the minimum requirements.

### By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The ‘% landings’ column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

## SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the ‘target’ or ‘main’ species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the ‘bycatch’ or ‘minor’ species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

**Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).**

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The ‘stock’ column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The ‘management’ column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

### TYPE 1 SPECIES (Representing 95% of the catch or more)

**Category A:** Species-specific management regime in place.

**Category B:** No species-specific management regime in place.

### TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)

**Category C:** Species-specific management regime in place.

**Category D:** No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Japanese pilchard / Japanese sardine	<i>Sardinops sagax</i> (synonym <i>S. melanostictus</i> )	Pacific Ocean stock and Tsushima warm current stock	NA	Japan	C

## CATEGORY C SPECIES

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment. In a by-product assessment, Category C species are those which are subject to a species-specific management regime, and are usually targeted species in fisheries for human consumption.

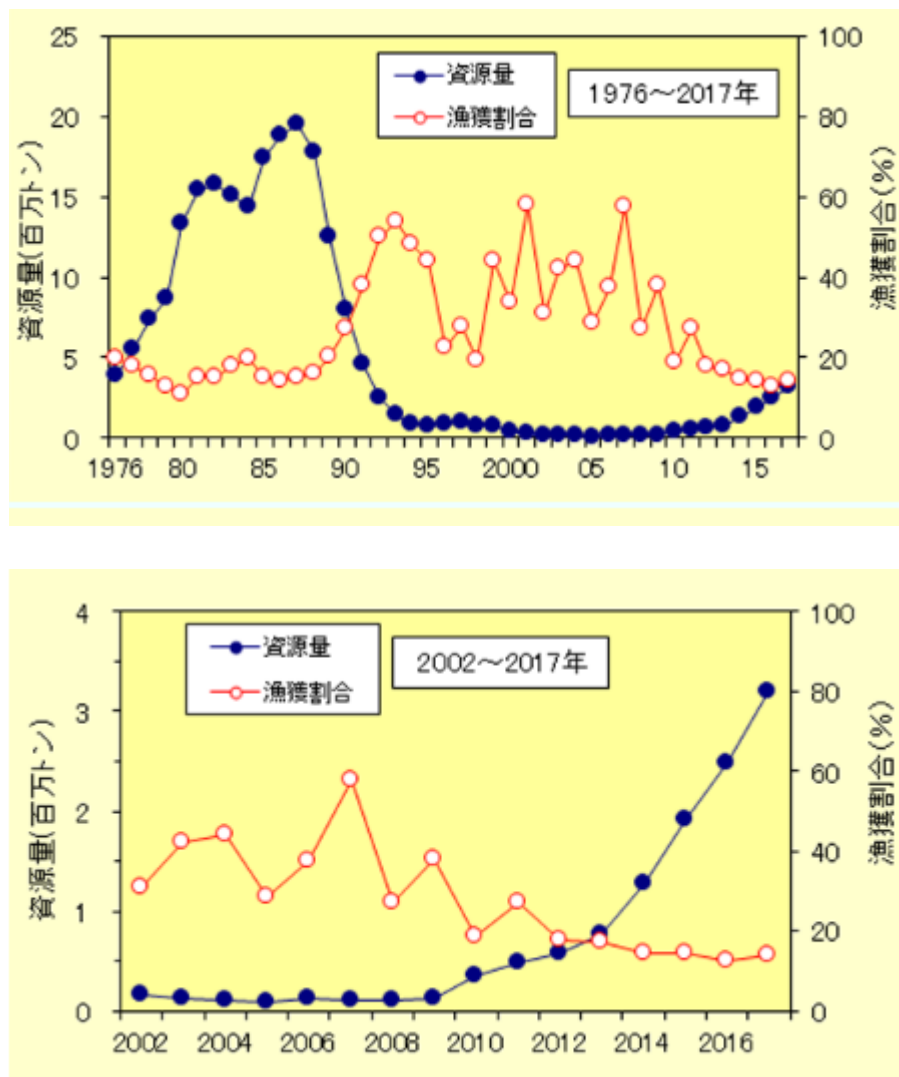
Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		Japanese pilchard / sardine <i>Sardinops sagax</i> (synonym <i>S. melanostictus</i> )	
C1	<b>Category C Stock Status - Minimum Requirements</b>		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	Pass
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	Pass
<b>Clause outcome:</b>			<b>Pass</b>
<b>Evidence</b>			
<b>C1.1:</b>			
<p>There are two stocks of Japanese sardine in the waters around Japan – the Pacific Ocean stock and the Tsushima Warm Current Stock. Stocks are assessed separately but managed together under a single TAC for combined stocks. The Pacific stock spawns November to June from Shikoku to the Kanto region, while the Tsushima stock spawns January to June from around Nagasaki to Toyama prefecture.</p> <p>The stocks may be transboundary but foreign vessels have not harvested Japanese sardine within Japan’s EEZ since 1994. Beyond Japan’s EEZ, the Tsushima Warm Current stock may be fished by Korean vessels and potentially as bycatch in Chinese and Taiwanese fisheries in the Yellow Sea.</p> <p>Annual stock assessment is undertaken by the Central Fisheries Research Institute of Japan’s Fisheries Research Agency (FRA). Stock abundance is calculated by cohort analysis based on catch by age since 1976. Tuning is performed using three resource index values reflecting the amount of i) recruitment, ii) 1 year old fish and iii) parent fish. Reference points are defined for the stock.</p> <p><b>Fishery removals of the species in the fishery under assessment are included in the stock assessment process. The stocks pass Clause C1.1.</b></p>			
<b>C1.2:</b>			
<p>An upper biomass reference point of 5 million tonnes, a ‘Blimit’ reference point of 221,000 tonnes (based on parent fish volume in 1996) and a ‘Bban’ reference point of 22,000 tonnes based on the low resource level period of the 1950s and 1960s have been calculated. Below Bban level fishing is banned. Stocks are classed as ‘high’ if above 5 million tonnes, ‘moderate’ if between Blimit and 5 million tonnes and ‘low’ if below Blimit.</p> <p>The most recent estimate of SSB was 891,000 t, significantly above the Blimit of 221,000 t and an increase from previous estimates. Thus the stock is currently above PRI (point at which recruitment could be impaired).</p>			

FRA stock assessments do not include official target reference points but mention a management goal of maintaining current SSB. There is no stated objective to rebuild the stock to official target reference points although the FRA stock assessment mentions a management goal of maintaining current SSB.

The latest stock assessment information available is from 2017 (R1). There is an increasing trend in the parent stock over the last 5 years (2012-2017). Total stock was estimated at 3.2 million tonnes in 2017; estimated total stock biomass trends followed the same historical patterns as SSB (Figure 1) (R1). The amount of parent fish exceeds Blimit so the resource level is considered moderate.

**Stocks are considered, in their most recent assessment, to have a biomass above the limit reference point (or proxy) so they are considered to pass clause C 1.2:**



**Figure 1.** Stock assessment of Japanese sardine *S. melanostictus* over the period 1976 – 2017 (top) and the most recent 15-year period (bottom). Blue line shows biomass, red line shows catch ratio. Left scale shows stock volume (million tonnes, t) and right scale shows catch ratio (%). Catch ratio is the ratio of catch volume to resource volume.

## References

R1: Furuichi, Watanabe Chikako, Ryuga Yuukami, Yasuhiro Uemura, Riko Inosumi, Miho Udagawa. Heisei 29<sup>th</sup> stock assessment report (digest version, 2017 assessment): [http://abchan.fra.go.jp/digests2018/html/2018\\_01.html](http://abchan.fra.go.jp/digests2018/html/2018_01.html)

R2: Fishsource (accessed 24.06.19) [https://www.fishsource.org/stock\\_page/2317](https://www.fishsource.org/stock_page/2317)

Standard clauses 1.3.2.2

## SOCIAL CRITERION

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.

## Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

*“The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of  $r_m$  (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of  $K$ ,  $t_m$  and  $t_{max}$  and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, assuming that these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on  $r_m$  (see below) as we are not yet confident with the reliability of the current method for estimating  $r_m$ . If users have independent  $r_m$  or fecundity estimates, they can refer to Table 1 for using this information.”*

Parameter	High	Medium	Low	Very low
Threshold	0.99	0.95	0.85	0.70
$r_{max}$ (1/year)	> 0.5	0.16 – 0.50	0.05 – 0.15	< 0.05
$K$ (1/year)	> 0.3	0.16 – 0.30	0.05 – 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 – 1000	10 – 100	< 10
$t_m$ (years)	< 1	2 – 4	5 – 10	> 10
$t_{max}$ (years)	1 - 3	4 – 10	11 – 30	> 30

Taken from the FishBase manual, “Estimation of Life-History Key Facts”:  
<http://www.fishbase.us/manual/English/key%20facts.htm#resilience>



## Appendix B – Background on the 5% catch rule

The proposed fishery assessment methodology uses a species categorisation approach to divide the catch in the assessment fishery into groups. These groups are:

- **Category A:** “Target” species with a species-specific management regime in place.
- **Category B:** “Target” species with no species-specific management regime in place.
- **Category C:** “Non-target” species with a species-specific management regime in place.
- **Category D:** “Non-target” species with no species-specific management regime in place

The distinction between 'target' and 'non-target' species is made to enable the assessment to consider the impact of the fishery on all the species caught regularly, without requiring a full assessment be conducted for each. Thus 'target' species are subjected to a more detailed assessment, while 'non-target' species are considered more briefly. For the purposes of the IFFO RS fishery assessment, 'target' and 'non-target' species are defined by their prevalence in the catch, by weight. Applicants must declare which species are considered 'target' species in the fishery, and the combined weight of these must be at least 95% of the annual catch. The remaining 5% can be made up of 'non-target' species. Note also that ETP species are considered separately, irrespective of their frequency of occurrence in the catch.

The proposed use of 5% as a limit for 'non-target' species is one area in which feedback is being sought via the public consultation. The decision to propose a value of 5% ensures consistency with other fishery assessment programmes, such as the MSC which uses 5% to distinguish between 'main' and 'minor' species (see MSC Standard, SA3.4 and GSA3.4.2); and Seafood Watch, which uses 5% when defining the 'main' species for the assessment (see Seafood Watch Standard, Criterion 2). The value is also consistent with the approach used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.