

THE ATLANTIC-WIDE RESEARCH PROGRAMME FOR BLUEFIN TUNA
(GBYP Phase 10)

SHORT TERM CONTRACT FOR BFT GROWTH IN FARMS
STUDY
(ICCAT GBYP 2020/04-b)

Deliverable 5: Final Report

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AquaBioTech Group
Dr. Simeon Deguara, CRO Director



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1. Background

In relation the Commission request Rec. 18-02, parag. 28, AquaBioTech Group was awarded with a GBYP contract in 2019 (ICCAT GBYP 2019/09-b) to initiate a growth in farms study in Maltese farms.

The farm in which the trial was carried out was MFF Ltd (ATEU1MLT00004) located in the South East Aquaculture Zone of Malta (approximately 6 km off the coast). Initially, three catches of BFT (2nd, 4th and 5th of June) were placed into the same cage during three cagings (24th, 20th, 18th of June 2019 respectively). The Trial Cage was EU.MLT.004MFF (70m diameter, 35m deep).

The full details of the three catches and subsequent cagings are:

- eBCD No. TN19900004-LT01; catch date 2nd June 2019; coordinates: 34-29N/13-57E; caging date: 24-06-2019.
- eBCD No. TN19900008; catch date 4th June 2019; coordinates: 34-45N/13-56E; caging date 20 June 2019.
- eBCD No TN19900011-LT01; catch date: 5th June 2019; coordinates: 35-17N/13-41E; caging date 18 June 2019.

Analysis of the stereocamera footage of each of the cagings was completed with a total of 2736 fish counted and an overall average SFL of 202.77cm and (calculated) RWT of 154.90kg.

Harvesting of the fish in the experimental cage was carried out between the 1st of October and the 12th of October 2019. A total of 2580 fish were harvested during the harvesting operations, leaving 156 fish as carryover to be harvested in 2020. There were no mortalities between caging and harvest in 2019. The results from this study are available at:

https://www.iccat.int/GBYP/Docs/Biological_Studies_Phase_9_Growth_Farms_Malta.pdf

In order to complete this study through the monitoring till harvesting of the 156 fish that were carried over, AquaBioTech Group was awarded with the contract: “Short-term contract for BFT growth in farms study (ICCAT GBYP 2020/04-b) of the Atlantic-wide research programme for bluefin tuna (ICCAT GBYP Phase 10)”. The following is the final report of the activities carried out under this contract (Deliverable 5).

2. Summary of Stereocamera analysis of unharvested BFT

A stereocamera footage of the remaining BFT (unharvested fish, transfer) was taken on the 1st of April 2020 (150 fish counted). The fish were transferred into a smaller cage, 50m diameter and 30m deep. This stereocamera footage was taken as part of a transfer process in which fish were passed from one cage to another through a gate. With the number of fish present and considering the fish have been in the farm cages for many months, the number of fish counted likely represented the complete (100%) count of the number of fish in the cage. The duration of fish passage through the gate was about 14 minutes and the diver was positioned on one side of the gate.

The distribution of SFLs in stereocamera recording taken are presented in **Figure 1**.

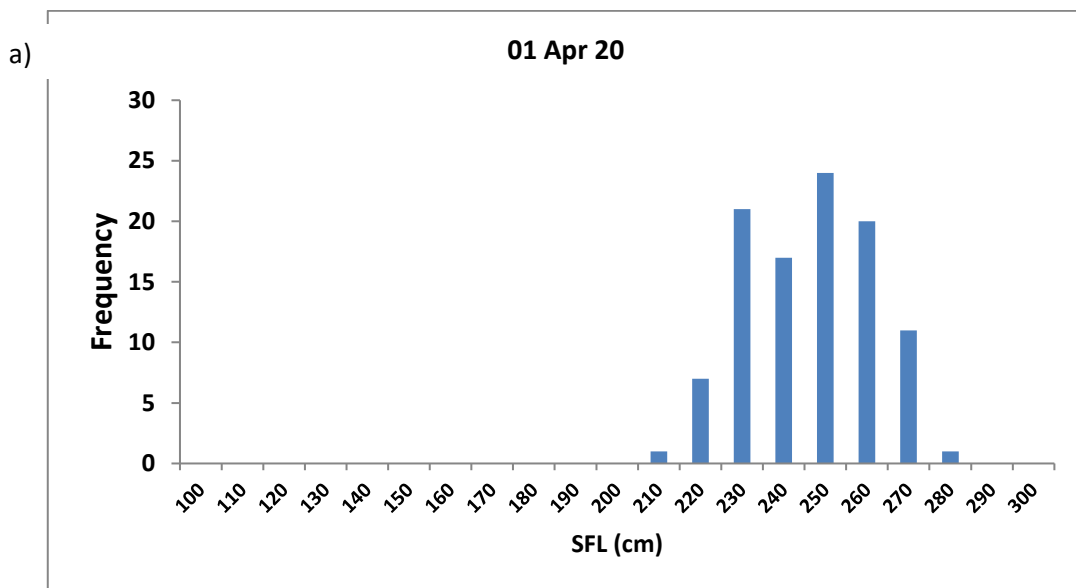


Figure 1. Stereocamera SFL measurements of BFT in experimental cage carried out on the 1st of April 2020.

Another stereocamea footage (immersion) was taken on the 26th of August. However, after being analysed and checking with the farm, it was confirmed by the farm that this footage was taken from the wrong tuna cage and not from the GBYP experimental cage. On the day of the footage, there was a misunderstanding and the diver who took the footage did so from the wrong cage.

3. Stereocamera prior to harvesting

Another stereocamera filming was planned to be carried out a few days before the cage had to be harvested, but this was not able to be carried out due to bad weather leading up to the start of harvest. The remaining fish were all harvested on the 16th of October 2020. The SFL and RWT of all the remaining 149 were recorded individually.

The number of fish harvested, corrected by an additional fish which died (26th of August 2020), gives a total of 150 fish, which number corresponds with the number of fish counted during the carryover transfer in April. However, there is a discrepancy of 6 fish from the initial estimated number at first caging from a total average estimated number of 2736 caged fish. This difference in fish numbers is not completely unexpected and occurs due to the fish behaviour during the first transfers from the transport cage to the farm cage at the caging operations. When fish pass through the gate they can sometimes pass in groups making it difficult for the person analysing the footage to count the fish behind the fish in front (from the perspective of the stereocamera position at the side of the gate) and also due to fish crossing during the transfer such that fish previously counted may be double counted in a later frame.

The RWT and SFL of the harvested fish were recorded individually as per standard GBYP procedures (SAMPLING PROTOCOLS FOR THE GBYP BIOLOGICAL SAMPLING; Last revised: 18 July 2018 (https://www.iccat.int/GBYP/Docs/Biological_Studies_Phase_8_Sampling_Protocol.pdf)).

The distribution of SFLs and RWTs of harvested fish are shown in **Figures 2a** and **2b** respectively. The corresponding L-W relationship of the harvested fish is presented in **Figure 3**.

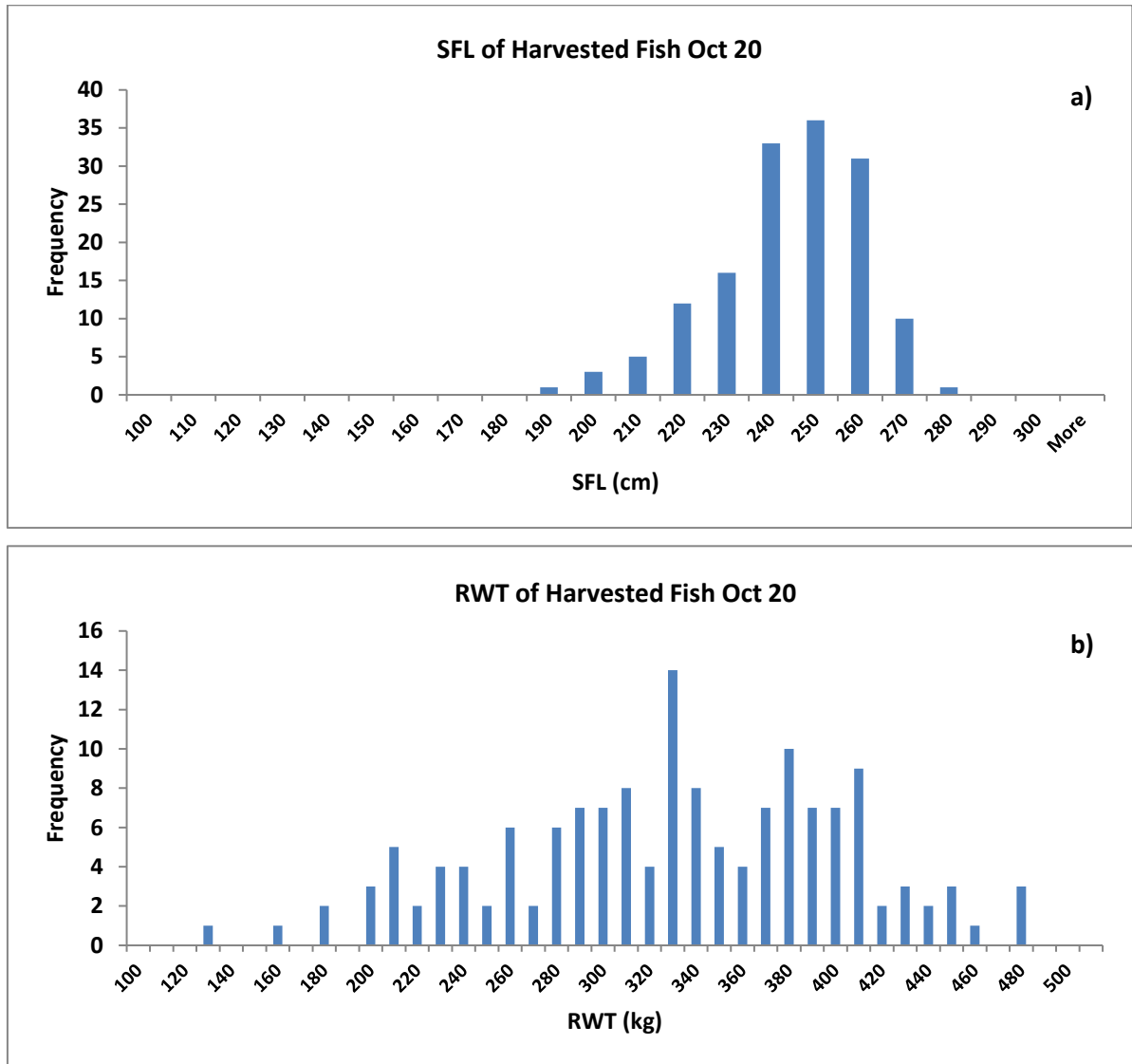


Figure 2. SFL and RWT distributions of harvested fish (a and b respectively) of 16th October 2020 harvested fish from the trial cage.

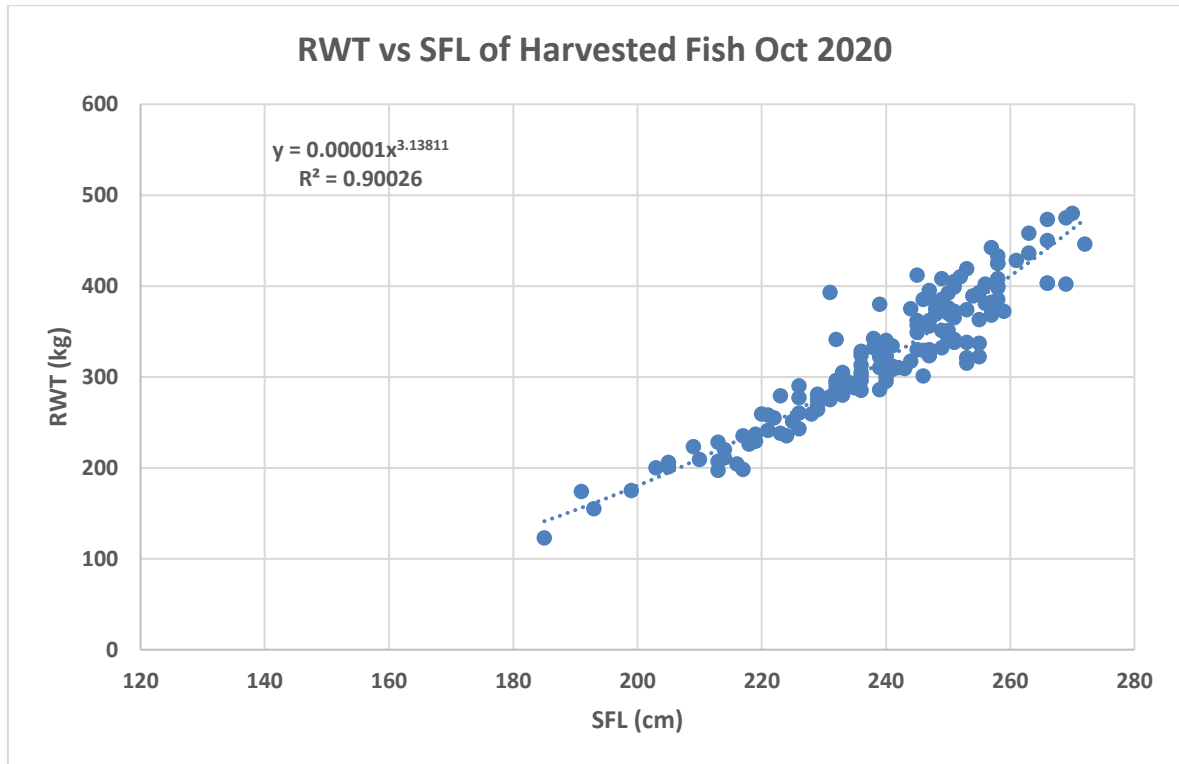


Figure 3. L-W relationship of harvested fish of 16th October 2020.

The average SFL at harvest was 239.82cm and the average RWT was 325.68kg.

There was one recorded mortality, on the 26th of August 2020, with a RWT of 138kg.

4. Additional Information

The temperature of the water during the trial was recorded regularly. Salinity was 38ppt. The bait fish intake was also recorded when feeding took place. The average temperatures and the total bait fish fed to the BFT (from the 18th of December 2019 to final harvest on the 16th of October 2020) are summarised in **Table 1**.

Table 1. Summary of average water temperature and bait fish fed to the BFT from the 18th of December 2019 to final harvest day on the 16th of October 2020.

	Temp (°C)	Herring (kg)	Mackerel (kg)	Sardines (kg)	Other Fish (kg)
December 2019¹	17.9	1650			
January 2020	15.3	8250			
February 2020	15.0	5750			

March 2020	16.0	1000	1800		
April 2020	16.9	3000	1650		
May 2020	18.6	550	3800		
June 2020	20.6	1750	5050		
July 2020	25.8	11620	18410		
August 2020	27.1	14850	7150		
September 2020	26.7	31900	6600		
October 2020²	25.4	11550	4950		

1. From 18th December
2. Until harvest date of 16th October

The raw data on SFL measurements from the stereocamera footage and the SFL and RWT measurements at harvesting, together with water temperature measurements and bait feeding quantities, are available in the excel file attached as Appendix 1.

5. Acknowledgements

“This work has been carried out under the ICCAT Atlantic-Wide Research Programme for Bluefin Tuna (GBYP), which is funded by the European Union, several ICCAT CPCs, the ICCAT Secretariat, and other entities (see <https://www.iccat.int/gbyp/en/overview.asp>). The content of this paper does not necessarily reflect ICCAT’s point of view or that of any of the other sponsors, who carry no responsibility. In addition, it does not indicate the Commission's future policy in this area.”



Dr. Simeon Deguara

CRO Director

AquaBioTech Group

www.aquabt.com