



Serial No. N7296

NAFO SCR Doc. 22/023

SCIENTIFIC COUNCIL MEETING – JUNE 2022

Product to round weight conversion factors
for the Subarea 0 Greenland halibut fishery

M. A. Treble and K. Hedges
Fisheries and Oceans Canada, Freshwater Institute,
501 University Cres., Winnipeg, Manitoba, Canada R3T 2N6

Abstract

Fisheries catch estimation depends on the use of product to round weight conversion factors (CFs) that are appropriate to the product type. Ninety percent of the Greenland halibut catch in offshore SA 0 is processed as J-cut tail off product (gutted, tailed, headed using a diagonal cut to remove the head and collarbone). Fisheries and Oceans Canada does not include the J-cut tail off product in its list for Greenland halibut but an interim CF of 1.49 was provided in at-sea observer manuals and used by vessel operators and observers since 2007. In 2021, at the request of the Canadian fishing industry, the CF for J-cut tail off product was lowered from 1.49 to 1.4. Based on a review of at-sea observer experiments conducted in Subarea 0 the appropriate value to estimate round weight from J-cut tail off, dressed weight is 1.5 (round weight = J-cut tail off weight x 1.5), which is comparable with J-cut, tail off CF values used by other countries that fish in the SA0+1 stock area.

Introduction

Conversion factors (CFs) are used by managers, vessel operators and at-sea observers to convert product weight to live (round) weight, to estimate the total amount harvested (catch round weight = product weight x CF). National agencies typically identify CFs for species and fisheries within their jurisdictions (e.g. STACAC 1984, Norway and Russian Federation 2019). Fisheries observers may also conduct experiments to confirm the CFs used by the vessel captain (Kulka et. al 2000, Kulka 1983a, 1983b, 1985).

In 2020 Canadian companies operating in Subarea (SA) 0 requested a change in the CF for J-cut tail off, product from 1.49 to 1.4, to harmonize with companies fishing in southern Canadian areas and the Northwest Atlantic Fisheries Organization (NAFO) Regulatory Area. Managers agreed to this change, effective in 2021, despite the fact that this value would put the SA 0 fishery out of line with other countries fishing in SA 1 (half of the SA0+1 (offshore) Greenland halibut stock management unit) that use a CF of 1.5 for J-cut tail off product (Table 1).

This paper examines at-sea observer experiments conducted for J-cut tail off product from SA 0 in 2018 and 2021 to assess the impact of the change in CF on SA 0 catch estimation.



Product Forms and Conversion Factors

The frozen product types that are typically produced for Greenland halibut in SA 0 are:

- 1) whole
- 2) gutted
- 3) gutted, head off, tail off and collar bone out (diagonal cut to remove the head behind the fin, also known as J-cut or Japan Cut; Figs. 1 and 2).

The majority (~90%) of the Greenland halibut catch in offshore SA 0 is processed as J-cut tail off product. The remaining 10% is comprised of whole (5%) and gutted (5%) (source: at-sea observers and Fisheries and Oceans Canada Statistics). The J-cut tail off product is preferred by fish buyers and is considered a Grade A product. If a straight cut is used to remove the head, leaving part of the fin or gill cover, the product is downgraded to Grade B or C (Fig. 3).

A review of the conversion factors used in the SA 0 fishery conducted in 2007 found that DFO did not have a product type and CF for the gutted, head off, tail off, collarbone out (J-cut tail off) product type and as a result a range of factors were being applied by vessel captains and observers (DFO 2007). The Newfoundland at-sea observer manual at the time (Kulka *et al.* 2000) included a value of 1.49 for gutted, head off, tail off product. The DFO (2007) report examined at-sea observer experiments conducted during 1996 to 2006 and found the mean CF was 1.47 for J-cut tail off product. DFO (2007) went on to recommend that an interim value be implemented, while waiting for additional experiments to be conducted throughout the fishing season, to confirm the CF value. SA 0 managers adopted the CF recommended in the Newfoundland observer manual (1.49). However, additional experiments were not conducted and DFO Conservation and Protection did not update the product form list with this product type and interim CF. The value of 1.49 was used for the J-cut tail off Greenland halibut product in SA 0 from the late 2000's to 2021.

At-sea observers conducted experiments to redetermine accurate Greenland halibut product conversion factors in 2018 and 2021. These experiments were conducted in both Divisions 0A and 0B, throughout the fishing season (January to November), thus addressing the suggestion to expand the range of experiments in order to improve the CF estimation that was made by DFO (2007). The average value in 2018 was 1.49 (28 experiments) and in 2021 it was 1.50 (111 experiments) (Table 2).

Analysis

The absence of a formal CF for J-cut tail off product in the DFO list of Greenland halibut products has led to confusion among vessel operators and DFO managers. Prior to 2021 Canadian fishing vessels were using a CF of 1.49 for J-cut tail off product, which was appropriate based on observer experiments and was in line with what Greenland and other countries who fished in SA 1 were using. However, as of 2021 the conversion factor listed for gutted head off (1.4) is also being applied to J-cut tail off, a markedly different product, for which other countries fishing in SA 1 apply a more appropriate CF of 1.5. Lowering the CF for J-cut tail off product results in an underestimate of the actual catch for SA 0.

Based on this review of at-sea observer experiments the appropriate value to estimate round weight from J-cut tail off, dressed weight is 1.5 (round weight = J-cut tail off weight x 1.5), which is comparable with J-cut tail off CF values used by other countries that fish in the SA0+1 stock area. In 2021 the difference amounted to the removal of an additional 1,129 t (round weight) of Greenland halibut (DFO statistics indicated 87% of Arctic Region catch and 90% of Newfoundland Region catch was processed as frozen, gutted, head and tail off, which describes J-cut tail off product).

It is important to use accurate conversion factors to calculate catch weight. This is particularly true for transboundary stocks like SA0+1 (offshore) Greenland halibut, where the TAC is shared between Canada and Greenland, with sub-allocations in SA 1 to several other national fleets. While the removal of an additional 1,129 t of Greenland halibut does not seem large relative to the overall TAC and catch, it does represent

considerable value for the fishing companies and a significant correctable error in the amount of biomass removed if not recognized during stock assessments.

References

- DFO, 2007. Summary of product weight to round weight conversion factors for the NAFO Division 0A and 0B Greenland Halibut fishery. DFO Can. Sci. Advis. Sec. Sci. Resp. 2007/012.
- Kulka, D.W. 1983a. Method for determination of fish production conversion factors on commercial factory trawlers. CAFSAC Res. Doc. 83/25. 32 pp.
- Kulka, D.W. 1983b. Analysis of fish production conversion data collected in 1981 from the Northwest Atlantic. CAFSAC Res. Doc. 83/38. 14 pp.
- Kulka, D. W. 1985. A description of gutted and head off production for selected species with special reference to conversion factors from product to whole weight. CAFSAC Res. Doc. 85/105. 27 pp.
- Kulka, D. W., Miri, C. M., and Firth, J. R. 2000. Observer Program Training Manual-Newfoundland Region. 188 pp. <https://waves-vagues.dfo-mpo.gc.ca/Library/351341.pdf>
- Norway and Russian Federation. 2019. Joint Norwegian-Russian technical descriptions for products of joint stocks in the Barents Sea and Norwegian Sea and agreed conversion factors. 37 pp + Appendix. <https://www.fiskeridir.no/Yrkesfiske/Tema/Omregningsfaktorer>
- STACAC 1984. Statistical Co-ordinating Committee for the Atlantic Coast Standards. STACAC Document No. 2, Revision #1, June 1984. 7 pp.

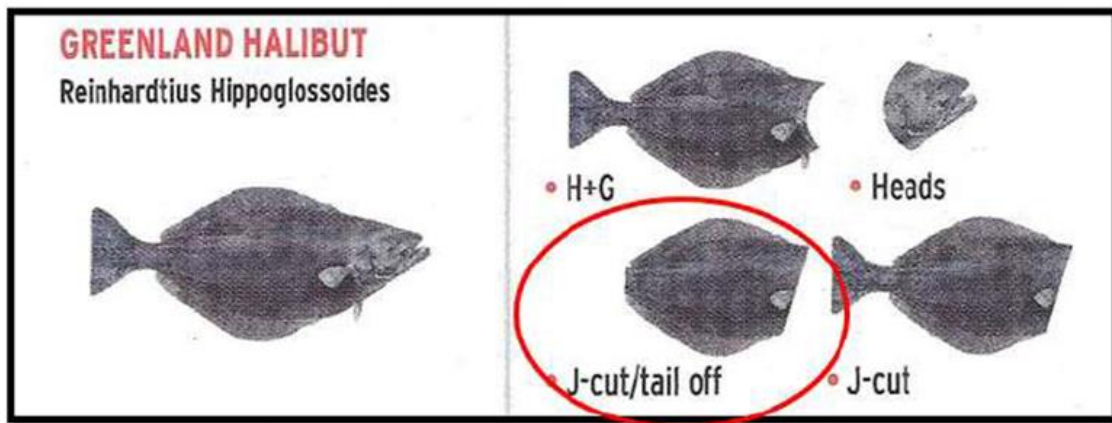
Table 1. Greenland halibut product conversion factors used by countries fishing in SA 0+1 in 2021 (nd=not defined). Sources: DFO-Conservation and Protection; Greenland authorities (R. Nygaard, pers. comm.); Faroe Islands authorities (L. Ruiz, pers. comm.); German authorities (H. Fock, pers. comm.); Norway and Russia (<https://www.fiskeridir.no/Yrkesfiske/Tema/Omregningsfaktorer>).

NAFO CEM Code	Frozen Product Form	Canada	Greenland	Faroe Islands	Norway	Russia	Germany
GUT	Gutted, Head on	1.10	1.10	1.10	1.12	1.12	1.10
GUH	Gutted, Headed	1.40	1.35	1.2	1.32	1.32	1.35
GHT	Gutted, Headed, Tailed	nd	nd	nd	nd	nd	nd
JAT	Gutted, Tailed, Headed with diagonal cut (i.e. collar bone, also known as J-cut or Japan cut)	nd [1.4] ¹	1.50	1.50	1.53	1.53	1.50

¹Product not listed in official statistics, fishers and ASOs given advice via direct memo.

Table 2. Conversion factor for J-cut tail off Greenland halibut product estimated through experiments conducted by Fisheries and Oceans Canada at-sea observers (ASO) (NL=Newfoundland region).

Product - Gutted, Tailed, Headed with collar bone out (diagonal cut to remove the head behind the fin, also known as J-cut or Japan Cut)	2018-ASO Experiments in SA0	2021-ASO Experiments in SA0
Average	1.49 (sd=.04)	1.50 (sd=.05)
Range	1.42-1.55	1.45-1.55
Number of Trips where experiments conducted	10	11
Number of Experiments	28	111



Picture Credit: <https://www.21food.com/products/halibut-340663.html>

Figure 1. Greenland halibut product types (<https://www.21food.com/products/halibut-340663.html>).

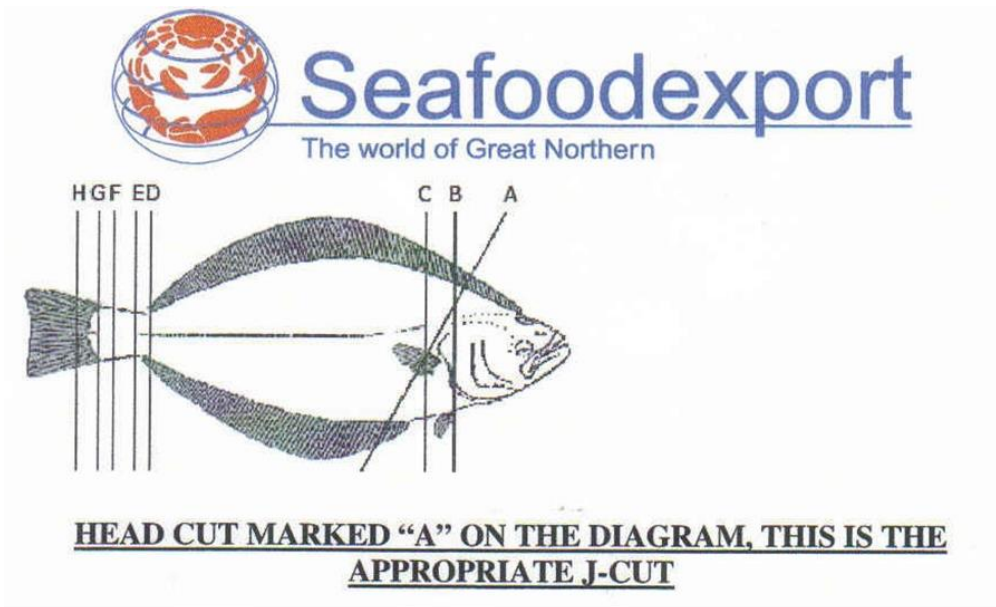


Photo Credit: BIOREX



Figure 2. Greenland halibut product types (top) and photo of a J-cut tail off product from the SA0 fishery (below).

GRADING CRITERIAS FOR GREENLAND HALIBUT HEADED AND GUTTED TAIL OFF

Reinhardtius Hippoglossoides



Shape of frozen product is also taken in consideration.

Shape may determine possibility of Jellied Product and or improper care and storage.

FACTORS	GRADE A	GRADE B	GRADE C	REJECT
FLESH ORDER	Fresh. Characteristic of species.	Neutral	Not Fresh	Tainted or Unwholesome. Foreign or Uncharacteristic of species.
CUT	Cut on angle not to include gill area and most of gut area removed. Cut behind fin. Clean cut See diagram	Includes some fin and Gill area with gut Area. Not Cleanly cut	Cut mostly straight across . Not cleanly cut	Not Cut
TAIL CUT	Most tail cut Clean cut see diagram	Some tail remaining Cut is not clean	Excessive tail remaining	N/A

Figure 3. Greenland halibut product grading criteria.