

METHODS OF DRESSING ATLANTIC BILLFISHES (ISTIOPHORIDAE) BY ICCAT REPORTING COUNTRIES

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SUMMARY

A survey was developed and distributed to ICCAT reporting nations in spring 1988 to determine the methods of dressing (cleaning), preserving, and holding Atlantic billfish (istiophoridae). Although not all ICCAT reporting countries responded to the survey, the results indicate that at least 10 major methods are used to dress billfish in the Atlantic Ocean. From these results, it is evident that regression relationships for lower jaw fork length (LJFL) and pectoral fork length (PFL), and LJFL and pectoral second dorsal length (PDL) will be valuable in developing the necessary length conversion factors for most ICCAT reporting nations.

Developing conversion factors for estimating round weight from the landed carcasses presents a problem because of the numerous methods used to dress billfish and the difficulty of obtaining the necessary measures of weight. One potential solution to this problem is the use of two-step conversions, first estimating LJFL from the landings and then using LJFL vs round weight regressions to estimate round weight. This type of approach might provide an adequate solution if sample sizes for these regressions are large (over 1,000) for both sexes of each species and the full size range is included for each sex of each species.

RESUME

Une prospection a été faite au printemps 1988 auprès des pays qui transmettent leurs données à l'ICCAT pour déterminer quelles étaient les méthodes de manipulation (nettoyage), conservation et emmagasinement des istiophoridés de l'Atlantique. Bien que les pays contactés n'aient pas tous répondu à cette enquête, les résultats indiquent qu'au moins 10 méthodes principales sont suivies pour préparer les istiophoridés dans l'Atlantique. D'après ces résultats, il est évident que le rapport de régression entre la longueur maxillaire-fourche et la longueur pectorale-fourche, et entre la longueur maxillaire-fourche et la longueur pectorale-deuxième dorsale sera intéressant pour élaborer les facteurs de longueur nécessaires pour la plupart des pays qui transmettent leurs données à l'ICCAT.

L'élaboration de facteurs de conversion pour l'estimation du poids vif d'après les carcasses débarquées présente un problème du fait des nombreuses méthodes utilisées pour préparer les istiophoridés, et de la difficulté d'obtenir les mesures de poids nécessaires. Une solution potentielle à ce problème est l'emploi de conversions en deux temps, tout d'abord en estimant la longueur maxillaire-fourche à partir des débarquements, puis en utilisant la régression longueur maxillaire-fourche vs. poids vif pour estimer le poids vif. Cette façon d'aborder la question pourrait donner une solution adéquate si la taille de l'échantillon de ces régressions est importante (plus de 1.000) pour les deux sexes de chaque espèce, et si la gamme complète des tailles est comprise pour chaque sexe et chaque espèce.

RESUMEN

En la primavera de 1988 se redactó una encuesta que fué distribuída entre los países que envían sus datos a ICCAT, destinada a designar los métodos de manipulación (limpieza), conservación y almacenamiento de marlines atlánticos (Istioforídeos). Si bien no todos los países respondieron a la encuesta, los resultados obtenidos indican que se emplean por los menos diez métodos para limpiar los marlines del Atlántico. De estos resultados se desprende de forma evidente que las relaciones de regresión entre mandíbula inferior/horquilla (MIH) y pectoral/horquilla (PH) y mandíbula inferior/horquilla y pectoral/segunda dorsal (PSD), será un dato importante para obtener los factores necesarios de conversión de talla a aplicar en el caso de la mayor parte de los países que envían sus datos a ICCAT.

La obtención de factores de conversión para estimar el peso vivo de las carcasas desembarcadas es problemática, debido a los numerosos métodos aplicados en la limpieza de los marlines y a la dificultad para conseguir las necesarias medidas de peso. Un posible solución a este problema es la aplicación de conversiones en dos etapas, estimando primero MIH en los desembarques y usando después MIH vs. regresiones de peso vivo para estimar el peso vivo. Este enfoque podría ser la solución adecuada si los tamaños de las muestras para estas regresiones son grandes (más de 1.000) para ambos sexos de cada especie y si se incluye toda la gama de tallas para cada sexo y para cada especie.

INTRODUCTION

During the 1987 SCRS session, a group meeting was held by ICCAT scientists to discuss the various research tasks of the Enhanced Research Program for Billfish. A summary of the meeting was published as Appendix 6 of the 1987 SCRS report. The report reviewed work to date, present program and budget, as well as identification of priority action items.

One of the high priority tasks to be carried out during 1988 was a survey of ICCAT reporting nations to obtain detailed descriptions of methods of dressing (cleaning) billfish. This task is important because knowledge of the methods of dressing billfish are a prerequisite for the develop of appropriate regression relationships for converting measures of length and weight into common units of measurement. In the case of billfish (Istiophoridae), the most reliable units for length and weight are lower jaw fork length (LJFL) and round weight (respectively). Ultimately, all ICCAT size frequency data sets will be converted into these common units of measurement for use in stock assessment. The removal of certain body parts obviously affects the type of measurements that can be obtained and thus a survey of methods of dressing billfish is the first step to resolving these problems. Unlike scombrids where only a few methods of dressing carcasses are used from country to country, many different ways are known for dressing billfish.

METHODS

Drs. Prince and Miyake developed the survey form (Table 1) that was circulated among all ICCAT reporting nations. The intent of the survey, which was circulated in French, Spanish, and English, was to determine the major methods of cleaning (dressing), preserving, and holding billfish. The survey was not meant to be exhaustive since response to the questionnaire was voluntary. In addition, it should be recognized that country representatives responding to the survey may not necessarily be familiar with all methods used by their country to dress billfish. This is particularly true with countries that harvest billfish using several different types of gear--different dressing methods are often used with different gears.

RESULTS AND DISCUSSION

Dressing Methods

Information on dressing billfish was obtained from 12 ICCAT reporting nations (Table 2). Eleven of the countries responded to the survey, while data from China-Taiwan was obtained from the transshipment port of St. Maarten, Netherlands Antilles, where longline boats from this country off-load. It is also worth noting that some of the major billfish harvesting nations (i.e. Cuba, Ghana) did not respond to the survey. Perhaps these data can be obtained at a later date. Many different types of dressing methods were employed and these varied from country to country, as well as with different types of fisheries within each

country (Fig. 1). Ten major types of methods for dressing billfish were identified (methods A-J, Fig. 1) and these ranged from landing fish with all fins and body parts intact (type A) to removing virtually all fins, viscera, head, and tail (type J). Except for type A, all methods removed viscera.

Some minor variations in the types of methods identified in this survey were noted from the questionnaire forms but we subjectively categorized only the major types of methods for the purposes of this study. For example, Uruguay reports that when heads are removed from billfish carcasses, the pectoral fin and part of the pectoral girdle are removed as well. However, this method was still categorized at type J (Fig. 1). If the pectoral fin and girdle are removed from carcasses, then the LJFL vs pectoral fork length (PFL) relationship can not be used to estimate LJFL for these fish.

Inconsistencies in applying a single type of dressing method were also observed from China-Taiwan at the transshipment port of St. Maarten (type I). Numerous carcasses were observed where pelvic and pectoral fins were left intact. These types of inconsistencies do not cause problems with obtaining the proper size frequency data since the more fins left on, the easier the carcasses are to measure and identify to species.

Preservation and Holding Billfish Carcasses

Questions 12-18 in the survey addressed various aspects of preservation and holding billfish carcasses at sea. Responses from many of the countries did not fill-out this portion of the questionnaire in great detail. Those responses that provided detailed answers varied greatly depending on the type of fishery and gear used and the country of origin. Most carcasses were kept whole but in some instances (Japan, Portugal) carcasses were fileted at sea. As might be expected, small vessels kept fish in fresh or in an iced condition, while larger vessels used blast freezers to hold fish at -50 to -60 °C. On larger vessels, glazing with water was often used and carcasses were reported held aboard some vessel for as long as two years or more (Japan).

Choosing Appropriate Conversion Factors

The type of methods used to dress billfish effect the selection of conversion factors used to transform size frequency measurements into common units. As a result of the findings of this survey, we feel that the LJFL vs PFL relationship (reported by Lee and Prince 1988, SCRS/88/43) can be used to estimate LJFL for dressing methods G, H, and I (Fig. 1). Conversion factors for estimating LJFL will not be necessary for billfish carcasses dressed using methods A-E (Fig. 1) since the body parts necessary for this measurement remain intact. The LJFL vs pectoral second dorsal length relationship (Lee and Prince 1988, SCRS/88/43) can be used to estimate LJFL for billfish carcasses

dressed using methods F and J (Fig. 1).

Developing conversion factors to estimate round weight will be more difficult than for measures of length. For example, 9 out of the 10 methods of dressing billfish involve carcasses with the viscera already removed. In addition, the wide variety of different body parts removed necessitates development of 9 different conversion factors for weight (Fig. 1). Obtaining accurate measures of weight at sea, through the billfish observers program, has been difficult because of boat movement (Prince, Diouf, Miyake, and Brown 1988, COM-SCRS/88/10). One possible solution to this is to use LJFL vs round weight regression relationships to estimate round weight. Historical data sets of this type are available from the U.S.A. tournament sampling program, where thousands of records for the three major species (blue marlin, white marlin, sailfish) contain LJFL, round weight, and sex for the full size range of each species. These data may offer a powerful method for estimating round weight even though two step conversions (estimating LJFL and then estimating round weight) are inherently less desirable than more direct approaches to the problem.

Table 1. Questionnaire sent to ICCAT reporting nations in 1988 to determine methods of dressing billfish (istiophoridae).

SURVEY TO DETERMINE METHODS OF DRESSING BILLFISHES
(ISTIOPHORIDAE) BY ICCAT REPORTING NATIONS FISHING
IN THE ATLANTIC OCEAN ADJACENT SEAS

COUNTRY _____

REPORTING AGENCY _____

PERSON IN CHARGE _____

DRESSING METHODS APPLY TO (Circle appropriate numbers)

1. Large longliner (over 50 MT capacity).
2. Small longliner (under 50 MT capacity)
3. Rod and reel fishing (commercial)
4. Rod and reel fishing (recreational)
5. Other fishing methods, specify _____

THE FOLLOWING FISH ARE COVERED BY THIS SURVEY (Circle appropriate numbers)

1. Blue marlin (Makaira nigricans)
2. White marlin (Tetrapturus albidus)
3. Sailfish (Istiophorus albicans)
4. Spearfishes (Tetrapturus spp.)

PLEASE REFER TO FIGURE 1 AND ANSWER THE FOLLOWING QUESTIONS (Circle yes or no and/or fill in the lines. You may use Figure 2 to describe the cuts you make on fish):

1. Do you bleed the fish? Yes No
If yes, where do you bleed (from gills, caudal peduncle, etc)?
Please explain _____
2. Is the upper bill (#1) removed? Yes No
3. Is the head (#2) removed as in Figure 1? Yes No
4. If head is removed but not cut off with "C" cut as indicated in Figure 1, please describe cutting method. (You may use Fig. 2 to describe a cut) _____
5. If head is not removed, are the gills removed? Yes No

Table 1. continued.

6. Are the viscera (internal organs) removed? Yes No
7. If the viscera are removed, does the cut stop before the pelvic girdle as in Figure 1 (#9), or is some other cutting method used? Please explain _____
8. Are all or part of the fins and spines (including the caudal fin) removed? Yes No
If yes, what fins/spines are removed?
 - a) First dorsal fin (#3). Yes No
 - b) First anal fin (#8). Yes No
 - c) Pectoral fins (#10). Yes No
 - d) Pelvic fins (#11). Yes No
 - e) Second dorsal fin (#4). Yes No
 - f) Second anal fin (#7). Yes No
 - g) Upper (#5) and Lower (#6) lobes of caudal fin. Yes No
9. If answers to 8a through 8e is yes, are the fins/spines removed at the skin line as in Figure 1? Yes No
10. If answer to question 9 is no, are the fins/spines removed by taking out the fin/spine roots (pterigiophores) along with the fins or spines? Yes No
If another method is used, please explain _____
11. If the caudal fin is removed (yes for question 8g), are the upper and lower lobes of the fin removed as indicated in Figure 1? Yes No
Or are part or all of the caudal peduncle removed as well? Please explain (or draw location of cut on Figure 2) _____
12. Are the carcasses a) Fileted or b) kept whole?
13. Indicate on the following choices how the fish are kept on the boat (Circle a letter):
 - a) Fresh
 - b) Fresh with ice
 - c) Fresh in brine
 - d) Frozen in brine
 - e) Frozen by freezer air blast (flash freezer)
 - f) Other _____

Table 1. continued.

14. Do you pre-freeze or pre-treat the carcasses? Please explain _____
15. If the billfish are flash frozen, are the fish held
a) In suspension or b) On the floor?
16. If frozen, at what temperature are they frozen? _____ °C
17. Are the carcasses glazed with ice or other liquid? Yes No
If yes, how many times are they glazed? _____ times
What liquid is used to glaze? _____
18. Where are the carcasses held aboard (after frozen or fresh)?

What is the maximum duration? _____
At what temperature are they held? _____ °C
19. Have you developed any conversion factors for converting dressed weight or length into whole live weight or length? Yes No
If yes, please attach the information to this questionnaire.
20. Other comments _____

PLEASE RETURN THIS QUESTIONNAIRE TO

International Commission for the
Conservation of Atlantic Tunas
Principe de Vergara 17-7^o
28001 Madrid, Spain

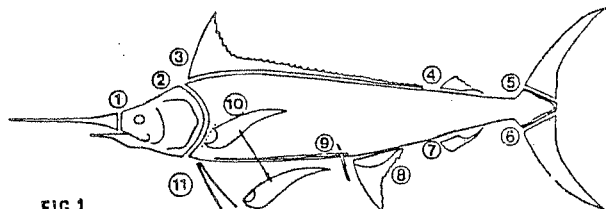


FIG.1

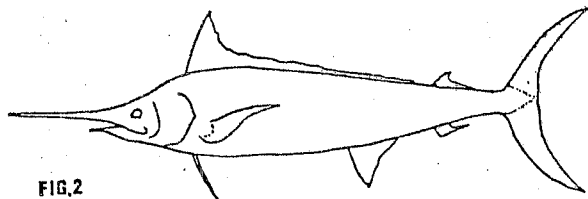


FIG.2

Table 2. Country, type of fishery, and method of dressing billfishes (istiophoridae) for ICCAT reporting nations responding to the survey (see Table 1). Letter designation (A-J) refers to the methods of dressing billfish illustrated in Figure 1.

Country	Type of Fishery	Type of Dressing Method
Brazil	Rod and reel (recreational) Large longliner Small longliner	A F C, E
Canada	Large longliner	D
China-Taiwan ¹	Large longliner Small longliner	I I
Japan	Large longliner	D
Korea	Large longliner	F
Portugal	Rod and reel (recreational)	C
Spain	No billfish fishery exists	
Senegal	Small longliner Rod and reel (recreational) Canoe (manual hand-line)	B B B
South Africa	Large longliner Small longliner	G G
Uruguay	Large longliner	J
United States	Small longliner Rod and reel (recreational)	J A
Venezuela	Small longliner	H

¹Did not respond to the survey but data was obtained from the transshipment facility in the port of St. Maarten, Netherlands Antilles.

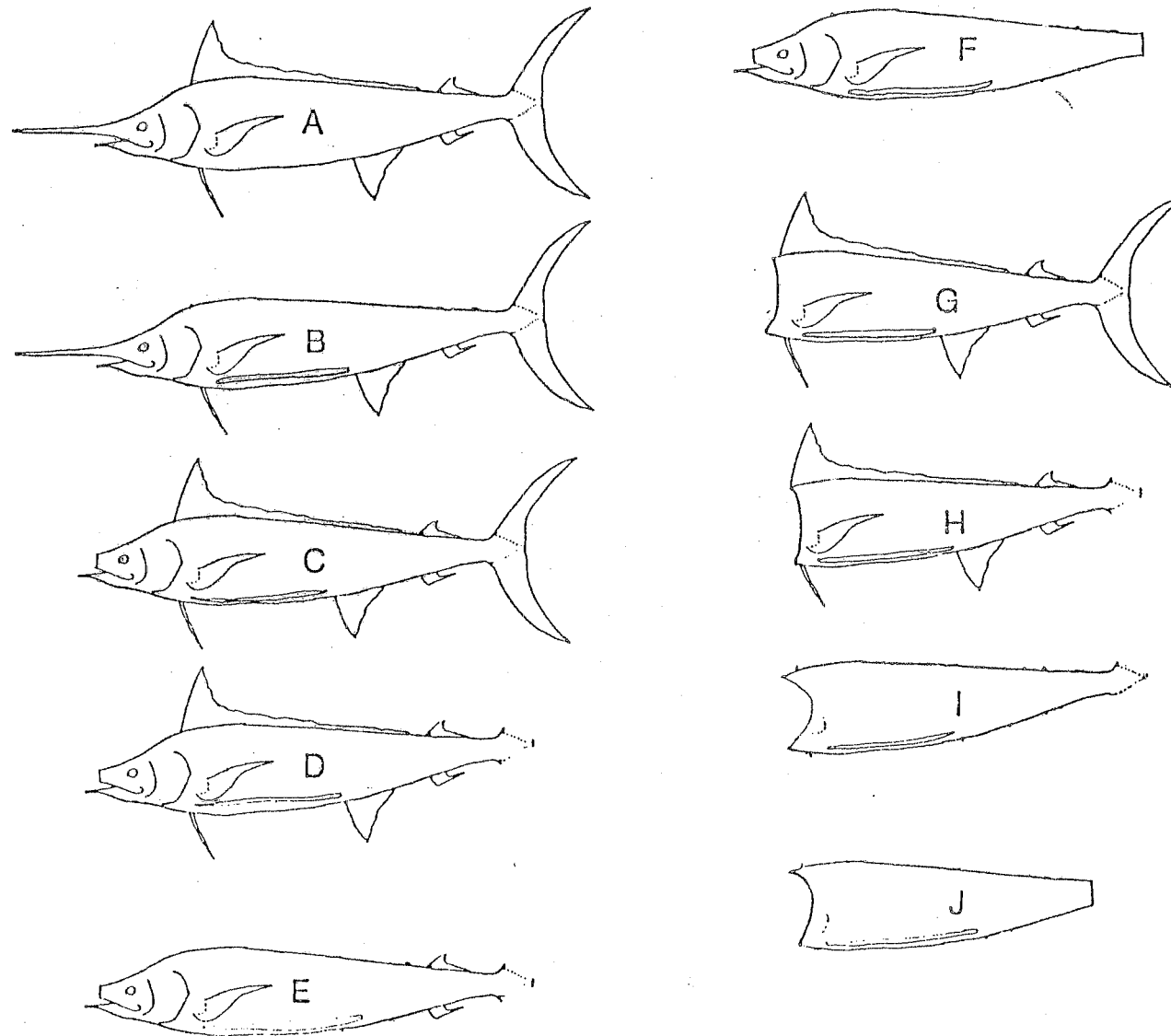


Figure 1. Methods of dressing billfishes (types A-J) by ICCAT reporting countries. Methods were established on the basis of responses to a survey taken during 1988.