

**A FACTOR TO CONVERT BELLY MEAT WEIGHT TO ROUND BODY WEIGHT
FOR ATLANTIC NORTHERN BLUEFIN TUNA (*THUNNUS THYNNUS*)**

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SUMMARY

Field investigation was performed in June, 1997, at Cartagena, Spain, to collect body weight and belly meat weight data on northern bluefin tuna (*Thunnus thynnus*). Based on a data set from 46 individuals, a factor of 10.9 to convert belly meat weight to round body weight was obtained.

RÉSUMÉ

Une recherche sur le terrain a été effectuée en juin 1997 à Carthagène, en Espagne, afin de collecter des données sur le poids du corps et sur le poids de la ventrèche de thon rouge du Nord (*Thunnus thynnus*). Sur le fondement d'un jeu de données de 46 individus, on a obtenu un facteur de 10,9 pour la conversion du poids de la ventrèche en poids vif du corps.

RESUMEN

Se llevó a cabo investigación de campo en junio de 1997 en Cartagena, España, para recolectar datos sobre el peso del cuerpo y el peso de la ventresca de atún rojo del norte (*Thunnus thynnus*). Basándose en un conjunto de datos de 46 individuos, se obtuvo un factor de 10.9 para convertir peso de la ventresca a peso del cuerpo sin eviscerar.

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INTRODUCTION

The northern bluefin tuna is highly rated as "sashimi" material in Japanese market. Yet, the bluefin tuna caught by purse seine in the Mediterranean Sea may sometime not be suitable for sashimi, especially when they were kept dead in water for relatively longer time. This is due to the large body size and warm-bodiedness. However, the abdominal part, called "toro", may receive less effect, and only this part (belly meat) is cut off to export to Japanese market. SCRS has not anticipated this type of fish export or processing and hence ICCAT "Field manual" does not contain conversion factor for this type of product (Anonym, 1995). The conversion factor of the belly meat to the round body weight has not yet been investigated. In 1997, Japanese Fishery Agency and ICCAT representative arranged field investigation for collecting data to obtain a conversion factor under collaboration with Spanish scientist. In this report, the data obtained and a conversion factor estimated are introduced.

MATERIAL AND METHOD

All investigations were carried out in two factories owned by Ricardo Fuentes Co. Ltd., during 18 to 23 June 1997 at Cartagena Spain. Whenever possible, origin, sex, fork length and weight of the fish and gear type used were recorded. To track individual fish, labels were attached on the abdomen using stapler when body weight or length of fishes were measured. Two pieces of belly meat (one side and the other) dissected from a fish were further processed by removing peripheral part and mesentery for making final form of product. One side of belly meat carrying label was weighed before or after the processing. The belly meat weight was doubled to correlate with the round body weight.

RESULTS AND DISCUSSION

Individual data are presented in Table 1. All belly meats were processed from fishes caught by purse seine and landed in Italy. As individual body weight was sometimes not measured and some labels were broken and missed during processing, successful measurement on a set of round body weight and weight of final form of belly meat product was made in 46 out of 92 fishes labeled. The ratio of the final product weight to the round body weight ranged from 0.063 to 0.119 with an average of 0.091. Correlation between the final product weight and body weight is shown in Fig. 1. The correlation appeared to be linear and coefficient was high ($R^2=0.7995$). Formula for the regression line was $y=10.882x$ where x is belly meat weight and y is round body weight, and the conversion factor was estimated to be 10.9. Similar investigation in different locality and season might be necessary to clarify temporal and/or spatial variation in this factor.

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Reference

- Anonym, 1995. Report of the fourth meeting of the permanent working group for the improvement of ICCAT statistics and conversion measures. ICCAT PWG 4th Meeting, Madrid, November 1995, p. 185.

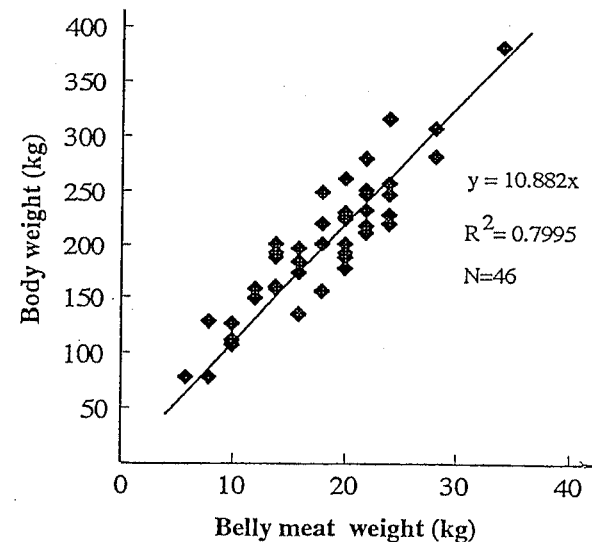


Fig. 1. Relationships between belly meat weight and round body weight of the Atlantic northern bluefin tuna (*Thunnus thynnus*).

Table 1. Individual data of northern bluefin tuna processed in Cartagena, June 1997.

Date	No.	Round body weight (kg)	Fork length (cm)	Belly meat weight (kg) processed	Belly meat weight (kg) unprocessed	Sex	Factory	Catch date	Landing site	Gear
6/18	1	269	295			F	Palma	NA	NA	LL
6/18	2	193	212			F	Palma	NA	NA	LL
6/18	3	135	192			F	Palma	NA	NA	LL
6/18	4	207	218			F	Palma	NA	NA	LL
6/18	5	150	203			F	Palma	NA	NA	LL
6/18	6	265	255			M	Palma	NA	NA	LL
6/19	1		214		38		Poligono	6/16	Cartagena	PS
6/19	2		218			F	Poligono	6/16	Cartagena	PS
6/19	3		216		17		Poligono	6/16	Cartagena	PS
6/19	4		188		15	M	Poligono	6/16	Cartagena	PS
6/19	5		267		30	M	Poligono	6/16	Cartagena	PS
6/19	6		267				Poligono	6/16	Cartagena	PS
6/19	7		166		20		Poligono	6/16	Cartagena	PS
6/19	8		148				Poligono	6/16	Cartagena	PS
6/19	9		151				Poligono	6/16	Cartagena	PS
6/19	10		185		11		Poligono	6/16	Cartagena	PS
6/19	11		129		4	M	Poligono	6/16	Cartagena	PS
6/19	12		158				Poligono	6/16	Cartagena	PS
6/19	A		125				Poligono	6/16	Cartagena	PS
6/19	B		138				Poligono	6/16	Cartagena	PS
6/19	C		153				Poligono	6/16	Cartagena	PS
6/19	D		149		5.9	M	Poligono	6/16	Cartagena	PS
6/19	E		216		13.4	F	Poligono	6/16	Cartagena	PS
6/19	F		275		30	M	Poligono	6/16	Cartagena	PS
6/19	G		198		7.6	F	Poligono	6/16	Cartagena	PS
6/19	H		146		5.6	M	Poligono	6/16	Cartagena	PS
6/19	I		197			F	Poligono	6/16	Cartagena	PS
6/19	J		153				Poligono	6/16	Cartagena	PS
6/19	K		164		9.5	M	Poligono	6/16	Cartagena	PS
6/19	L		189				Poligono	6/16	Cartagena	PS
6/19	M		227				Poligono	6/16	Cartagena	PS
6/19	N		176				Poligono	6/16	Cartagena	PS
6/19	O		217				Poligono	6/16	Cartagena	PS
6/19	P						Poligono	6/16	Cartagena	PS
6/19	Q						Poligono	6/16	Cartagena	PS
6/19	R						Poligono	6/16	Cartagena	PS
6/21	1-1	221		20			Poligono	6/16-17	Italy	PS
6/21	1-2	148		12			Poligono	6/16-17	Italy	PS
6/21	1-3	112		10			Poligono	6/16-17	Italy	PS
6/21	1-4	198		18			Poligono	6/16-17	Italy	PS
6/21	1-5	87					Poligono	6/16-17	Italy	PS
6/21	1-6	77		8			Poligono	6/16-17	Italy	PS
6/21	1-7						Poligono	6/16-17	Italy	PS
6/21	1-8			18			Poligono	6/16-17	Italy	PS
6/21	1-9	281		28	30		Poligono	6/16-17	Italy	PS
6/21	1-10	176		20			Poligono	6/16-17	Italy	PS
6/21	1-11	304					Poligono	6/16-17	Italy	PS
6/21	1-12	245		24	26		Poligono	6/16-17	Italy	PS
6/21	1-13	131					Poligono	6/16-17	Italy	PS
6/21	1-14	182		16			Poligono	6/16-17	Italy	PS
6/21	1-15	260		20	22		Poligono	6/16-17	Italy	PS
6/21	1-16	155		18			Poligono	6/16-17	Italy	PS
6/21	A	202	225				Poligono	6/16-17	Italy	PS
6/21	2-1	314		24			Poligono	6/16-17	Italy	PS
6/21	2-2	209		22			Poligono	6/16-17	Italy	PS
6/21	2-3	78		6			Poligono	6/16-17	Italy	PS
6/21	2-4	106		10			Poligono	6/16-17	Italy	PS
6/21	2-5	235					Poligono	6/16-17	Italy	PS
6/21	2-6	191		20			Poligono	6/16-17	Italy	PS
6/21	2-7	227					Poligono	6/16-17	Italy	PS
6/21	2-8	191		14			Poligono	6/16-17	Italy	PS
6/21	2-9	226		24			Poligono	6/16-17	Italy	PS
6/21	2-10	200		14			Poligono	6/16-17	Italy	PS
6/21	2-11	218		24			Poligono	6/16-17	Italy	PS
6/21	2-12	218		18			Poligono	6/16-17	Italy	PS
6/21	2-13	187		14			Poligono	6/16-17	Italy	PS
6/21	2-15	224		20			Poligono	6/16-17	Italy	PS
6/21	2-16	245		22			Poligono	6/16-17	Italy	PS
6/21	2-17	381		34			Poligono	6/16-17	Italy	PS
6/21	2-18	127		8			Poligono	6/16-17	Italy	PS
6/21	2-19	279		22			Poligono	6/16-17	Italy	PS
6/21	2-20	255		24			Poligono	6/16-17	Italy	PS
6/21	2-21	231		22			Poligono	6/16-17	Italy	PS
6/21	2-22	194		16			Poligono	6/16-17	Italy	PS
6/21	2-23	184					Poligono	6/16-17	Italy	PS
6/21	2-24		223			F	Poligono	6/16-17	Italy	PS
6/21	2-25		232				Poligono	6/16-17	Italy	PS

Table 1. continued

6/21	2-26	166				F	Poligono	6/16-17	Italy	PS
6/21	2-27	210				F	Poligono	6/16-17	Italy	PS
6/21	2-28	248					Poligono	6/16-17	Italy	PS
6/21	2-29	132					Poligono	6/16-17	Italy	PS
6/21	2-30	178					Poligono	6/16-17	Italy	PS
6/21	2-31	135					Poligono	6/16-17	Italy	PS
6/21	2-32	200					Poligono	6/16-17	Italy	PS
6/21	2-33	305					Poligono	6/16-17	Italy	PS
6/21	2-34	194					Poligono	6/16-17	Italy	PS
6/21	2-35	157					Poligono	6/16-17	Italy	PS
6/21	2-36	187					Poligono	6/16-17	Italy	PS
6/21	2-37	218					Poligono	6/16-17	Italy	PS
6/21	2-38	229					Poligono	6/16-17	Italy	PS
6/21	2-39	158					Poligono	6/16-17	Italy	PS
6/21	2-40	171					Poligono	6/16-17	Italy	PS
6/21	2-41	160					Poligono	6/16-17	Italy	PS
6/21	2-42	216					Poligono	6/16-17	Italy	PS
6/21	2-43	216					Poligono	6/16-17	Italy	PS
6/21	2-44	158					Poligono	6/16-17	Italy	PS
6/21	2-45	125					Poligono	6/16-17	Italy	PS
6/21	2-46	249					Poligono	6/16-17	Italy	PS
6/23	1	127		195			Palma	NA	Cartagena	LL
6/23	2	161		205			Palma	NA	Cartagena	LL
6/23	3	172		206			Palma	NA	Cartagena	LL
6/23	4	147		207			Palma	NA	Cartagena	LL
6/23	5	161		203			Palma	NA	Cartagena	LL
6/23	6	140		190			Palma	NA	Cartagena	LL
6/23	7	144		191			Palma	NA	Cartagena	LL
6/23	8	132		189			Palma	NA	Cartagena	LL
6/23	9	206		228			Palma	NA	Cartagena	LL
6/23	10	72		153			Palma	NA	Cartagena	LL
6/23	11	134		186			Palma	NA	Cartagena	LL
6/23	12	106		179			Palma	NA	Cartagena	LL
6/23	13	66		157			Palma	NA	Cartagena	LL
6/23	14	167		210			Palma	NA	Cartagena	LL
6/23	15	67		154			Palma	NA	Cartagena	LL
6/23	16	315		260			Palma	NA	Cartagena	LL
6/23	17	117		182			Palma	NA	Cartagena	LL
6/23	18	77		155			Palma	NA	Cartagena	LL
6/23	19	139		186			Palma	NA	Cartagena	LL
6/23	20	113		185			Palma	NA	Cartagena	LL
6/23	21	88		177			Palma	NA	Cartagena	LL
6/23	22	160		213			Palma	NA	Cartagena	LL
6/23	23	246		244			Palma	NA	Cartagena	LL
6/23	24	127		181			Palma	NA	Cartagena	LL
6/23	25	180		216			Palma	NA	Cartagena	LL