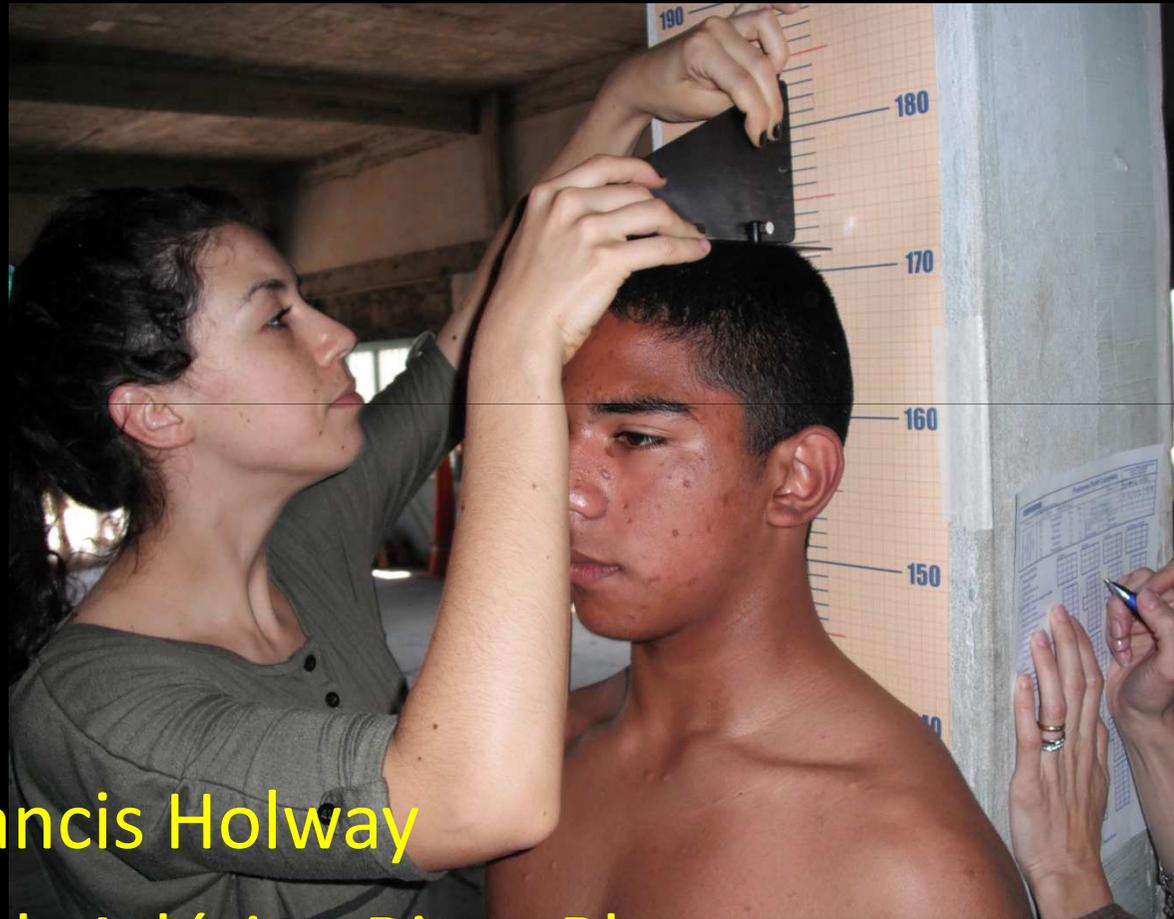


Evaluaciones antropométricas en niños deportistas de elite en Argentina



Francis Holway
Club Atlético River Plate,
Bs As, Argentina

Temas principales

- Objetivos
- Materiales y métodos empleados
- Algunos estudios antropométricos en deportistas juveniles de elite en Argentina
- Resultados

Objetivo principal: **construir referencias**
x deporte, edad, gradiente competitivo



Kinanthropometry of Group I rugby players in Buenos Aires, Argentina

FRANCIS EDWARD HOLWAY¹ & ROMINA GARAVAGLIA²

¹Club Atlético River Plate, Departamento de Medicina Aplicada a los Deportes, Medicina, Avenida Figueroa Alcorta, Buenos Aires and ²Unión de Rugby de Buenos Aires, Departamento Médico, Buenos Aires, Argentina

Table I. Descriptive anthropometry

	Prop (<i>n</i> = 22)	Hooker (<i>n</i> = 10)	Second row (<i>n</i> = 16)	Back row (<i>n</i> = 22)
Basics				
Age (years)	24.5 ± 4.1	25.2 ± 3.2	23.9 ± 2.8	24.6 ± 3.6
Body mass (kg)	105.0 ± 10.0	94.6 ± 5.4	101.6 ± 8.2	90.4 ± 9.4
Stature (cm)	179.2 ± 3.2	173.7 ± 4.2	189.3 ± 4.4	181.8 ± 6.1
Sitting height (cm)	95.6 ± 2.5	93.1 ± 1.6	99.1 ± 2.5	96.1 ± 3.9
Breadths (cm)				
Biacromiale	42.5 ± 1.7	42.5 ± 1.9	43.1 ± 2.1	41.9 ± 2.0
Transverse chest	33.8 ± 1.5	32.1 ± 1.7	32.0 ± 1.5	31.4 ± 2.3
Antero-post. chest	24.2 ± 1.6	22.6 ± 2.1	22.3 ± 1.8	21.3 ± 1.5
Bi-cristale	31.0 ± 1.6	29.5 ± 2.0	30.9 ± 1.7	30.2 ± 1.9
Humerus	7.6 ± 0.4	7.4 ± 0.3	7.7 ± 0.5	7.5 ± 0.5

Requerimientos

1. Capacitar evaluadores
2. Adquirir equipamiento
3. Acceder a deportistas
4. Construir planillas-soft
5. Compartir datos
6. Financiar proceso
7. Publicar resultados



Técnica de la ISAK (Soc Int'l Av Cineant)

www.isakonline.com

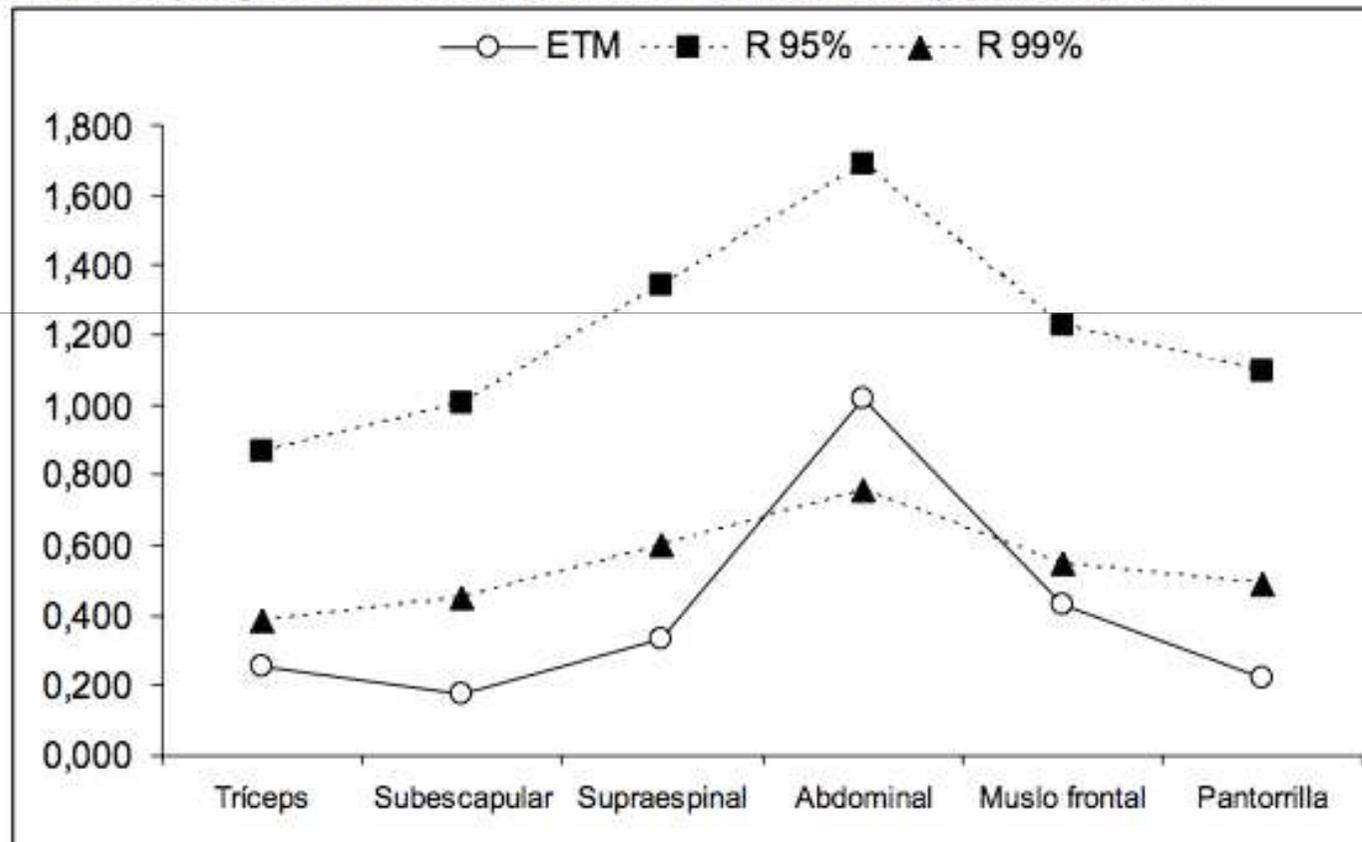
The screenshot shows the ISAK website homepage. At the top is the ISAK logo, a stylized blue 'ISAK' with a globe-like graphic below it. Below the logo is the text 'The International Society for the Advancement of Kinanthropometry'. A navigation bar contains links: HOME, HISTORY, EXECUTIVE, COURSES, MEMBERSHIP, PUBLICATIONS, RESOURCES, NEWS, EVENTS, CONTACT. A 'Login' button is in the top right. The main content area has a 'Welcome to ISAK' heading and a 'YOUR ACCOUNT' section with a 'Hi, guest!' message. An 'EVENTS' button is on the right. Four book covers are overlaid on the page:

- Physical Structure of Olympic Athletes** (Green cover): Part II: Biomechanics of Olympic Athletes. Editor: J.E.L. Carter.
- SOMATOTYPING DEVELOPMENT AND APPLICATIONS** (Yellow cover): Cambridge Studies in Biological Anthropology. Editors: J.E. Lindsay Carter & Barbara Honeyman Heath. The cover features a circular diagram with data points.
- Kinanthropometry in Aquatic Sports** (Blue cover): A Study of World Class Athletes. Editors: J. E. Lindsay Carter & Timothy R. Ackland. HK Sport Science Monograph Series Volume 5.
- FUTBOLISTA SUDAMERICANO DE ELITE: MORFOLOGIA, ANALISIS DEL JUEGO Y PERFORMANCE** (White cover): Resultados de las Investigaciones en Composición Corporal, Análisis del Movimiento y Análisis Táctico, en la Copa América 1995 (Uruguay). Editors: Edgardo Rienzi, Juan Carlos Mazza. Editor Consultante: J.E. Lindsay Carter, Thomas Reilly. Editor: Biosystem Servicio Educativo.

Error técnico de medición

$$ETM \text{ (mm)} = \sqrt{[\sum (d)^2 / 2n]}$$

Figura 1. ETM de pliegues con coeficientes de confiabilidad (R) al 95 y 99%.



Harpenden skinfold caliper 1954

BRIEF COMMUNICATION

THE HARPENDEN SKINFOLD CALIPER

J. M. TANNER¹ AND R. H. WHITEHOUSE²

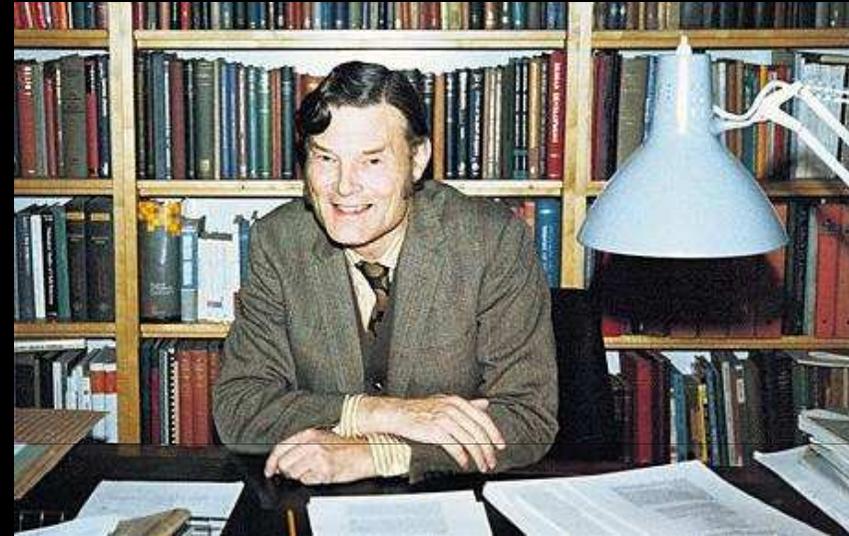
Sherrington School of Physiology, St. Thomas's Hospital, London, England

ONE FIGURE

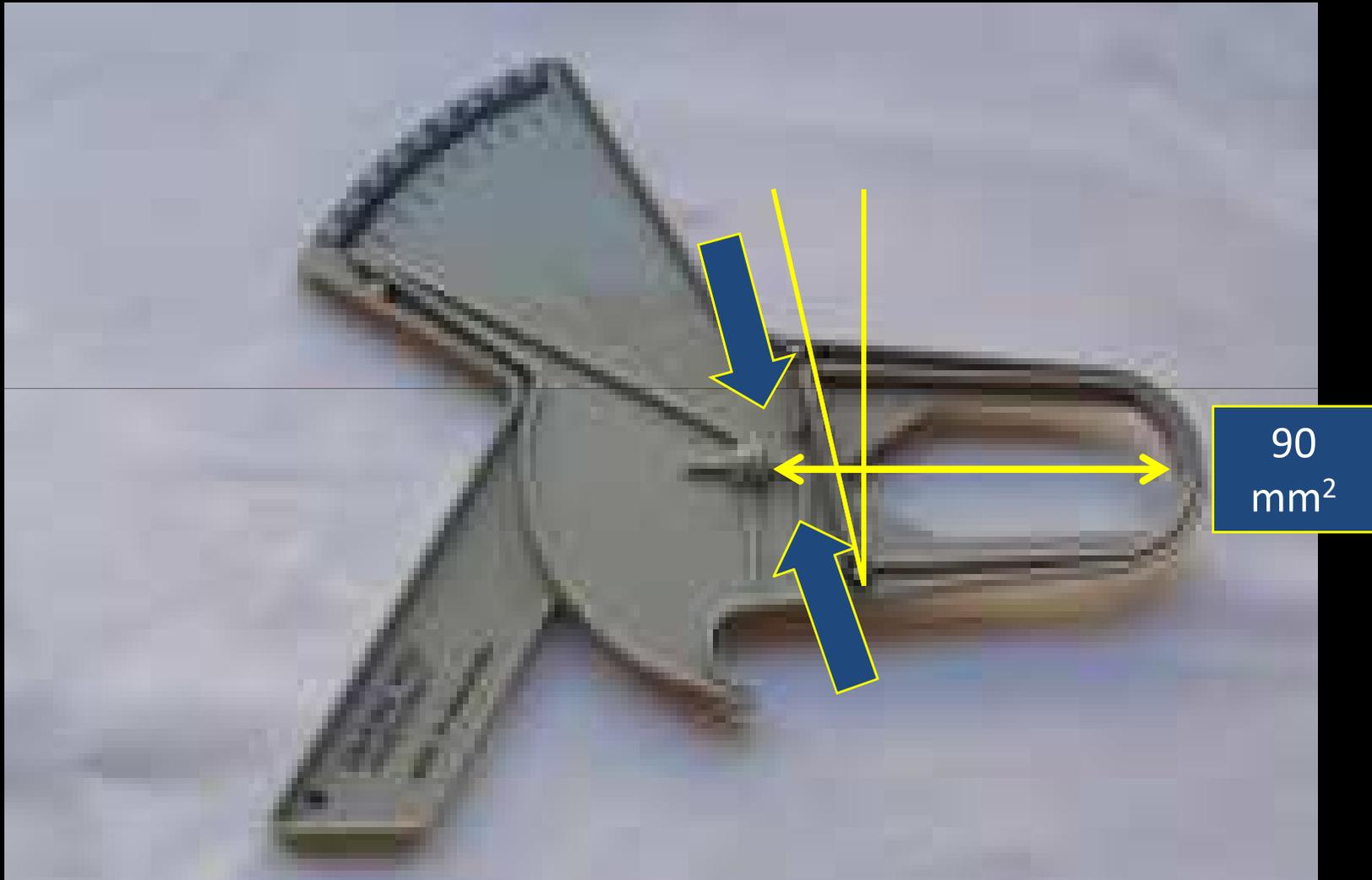
There are now available several ways of estimating the proportion of fat in the body. One of them is by measuring the thickness of folds of skin and subcutaneous tissue pulled away between the thumb and forefinger from the underlying structures. This method has the great merit of simplicity and cheapness, and though it probably cannot estimate total body fat with the accuracy of underwater weighing or chemical dilution methods it gives information about regional fat distribution which these others do not.

The thickness of the fold of skin and subcutaneous tissue is measured by applying some form of caliper to either side of it, and the reading obtained is dependent on the form and characteristics of the caliper used. If, for example, the jaws of the caliper are approximated by a spring, the reading will depend on the strength of the spring, since the tissue is compressible. Despite this, there has been little information published on the best design for these calipers until very recently, when at the request of the Medical Research Council an extensive investigation was set in train (Edwards, Hammond, Healy, Tanner and Whitehouse, '55). This paper should be consulted for the experimental results, but the recommendations emerging can be summarized as follows:

^{1,2} Present address: Institute of Child Health, Great Ormond St., London, W.C.1.



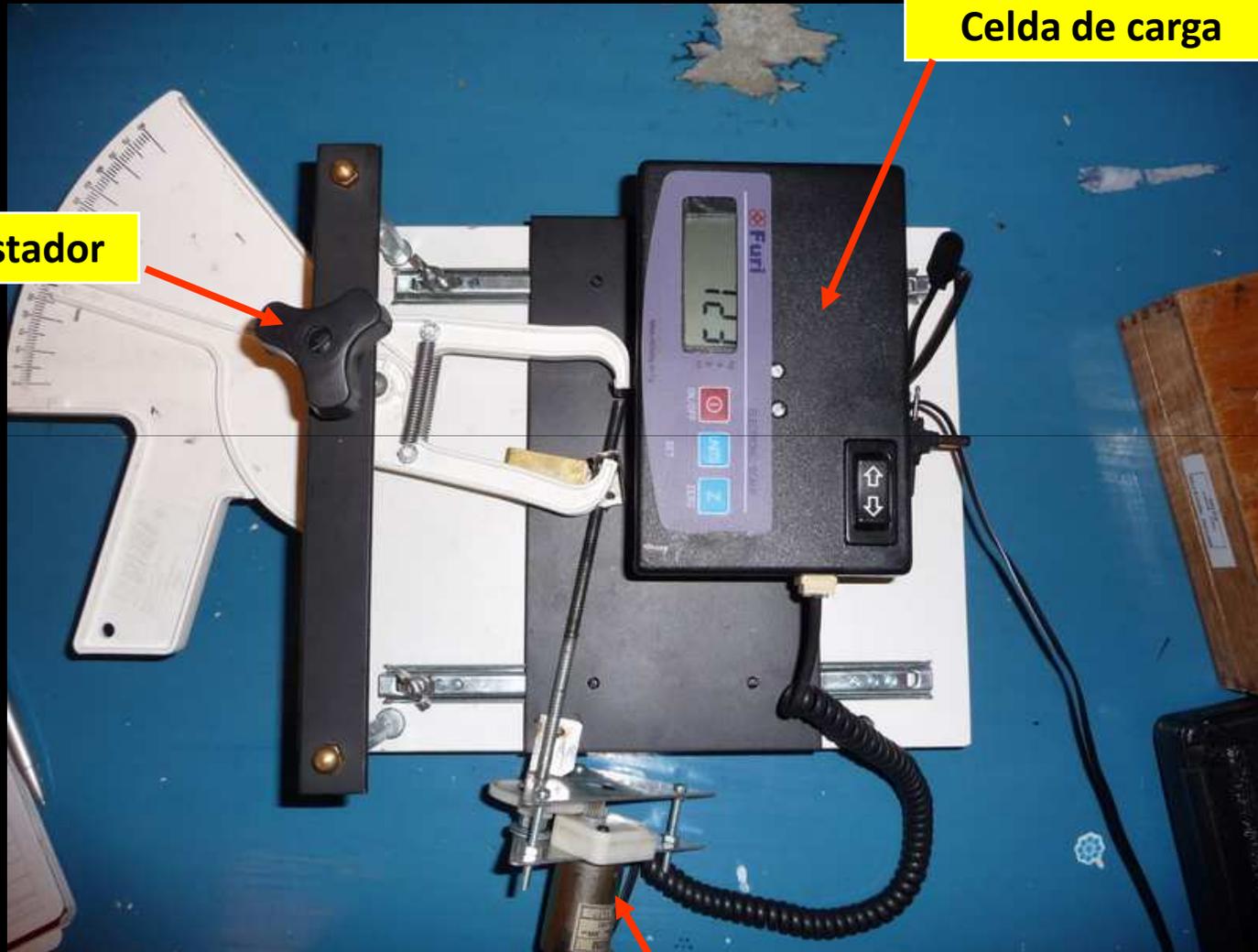
Gaucha-Pro (2002)



Plataforma para calibración

Celda de carga

Pivot y ajustador



Motor eléctrico para abrir ramas de calibre

Un método rápido para evaluar la adiposidad:
 Σ 6 pliegues (mm)



tríceps



supraespinal



Muslo anterior



subescapular

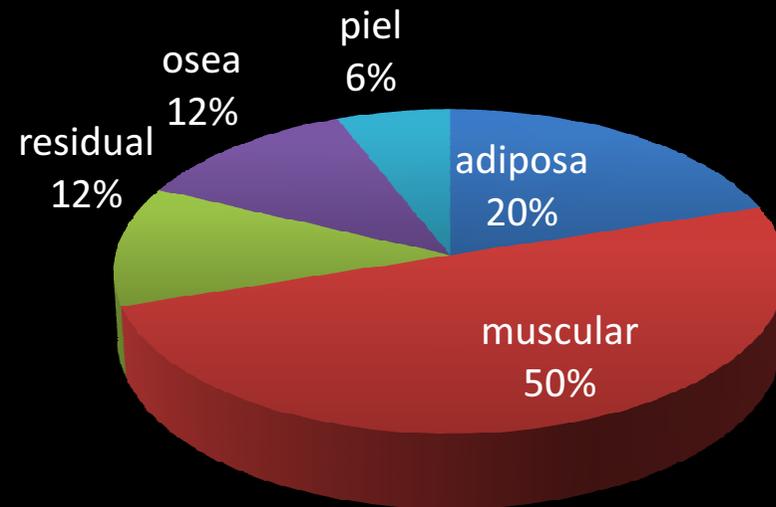


abdominal



Pantorrilla

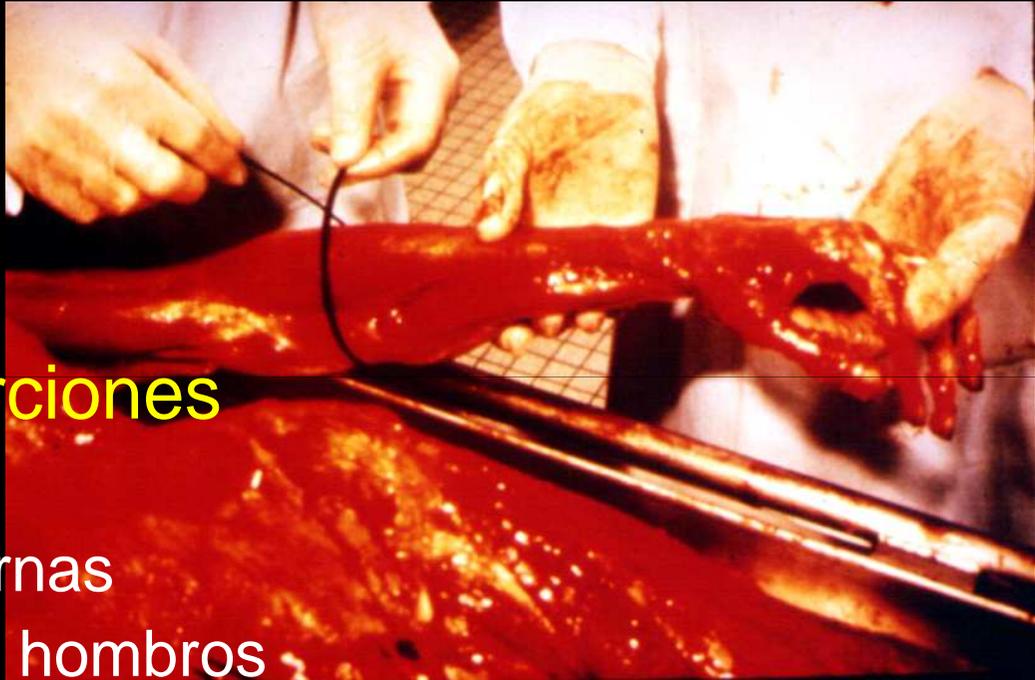
Fraccionamiento anatómico en 5 componentes & planillas de cálculo



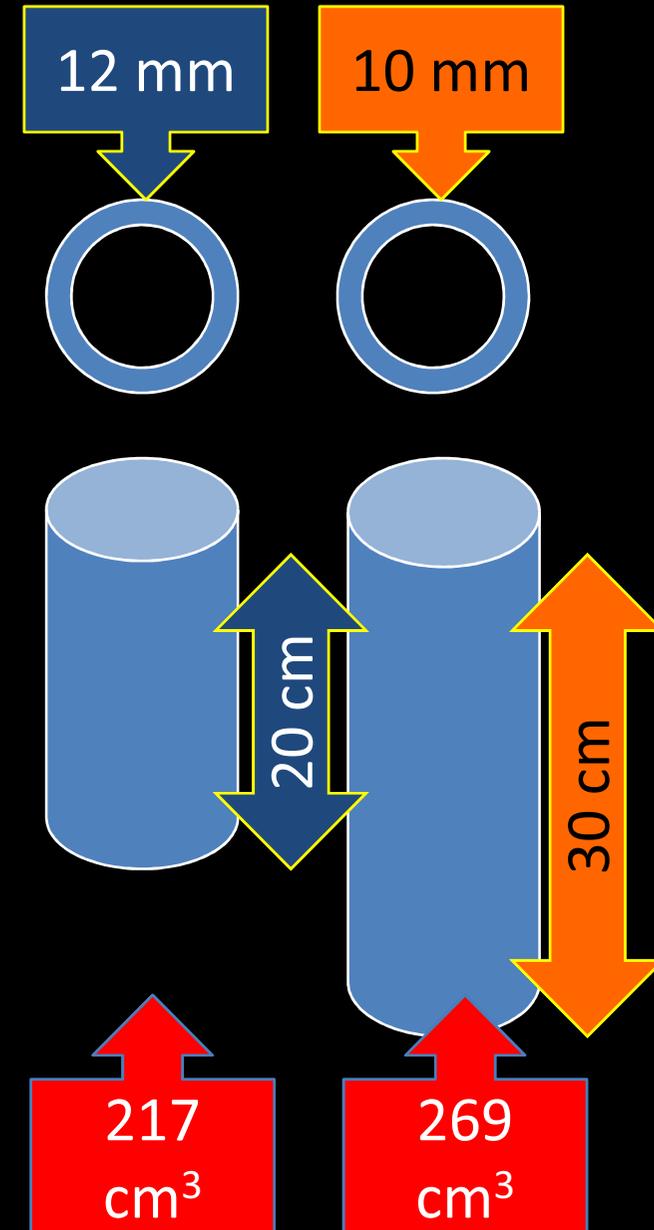
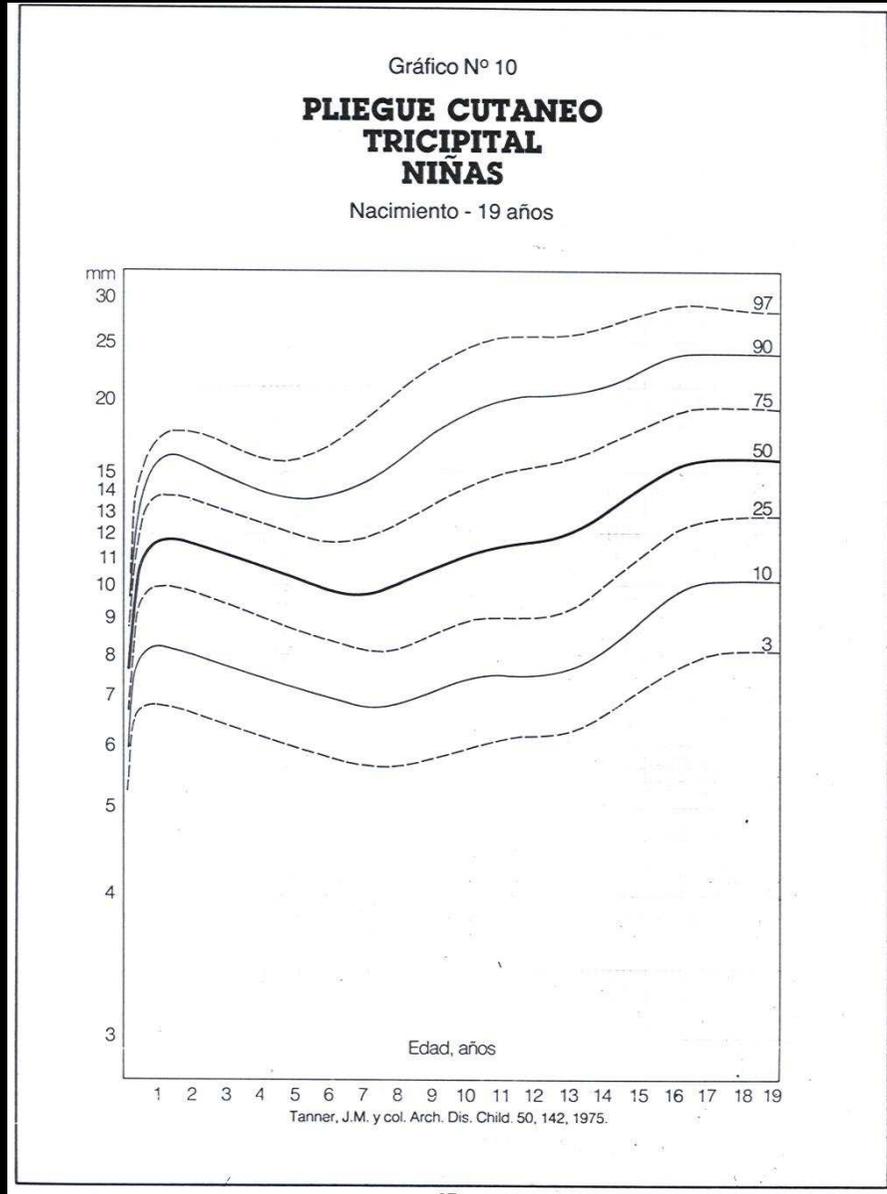
Ross, W.D., Kerr, D. A. Fraccionamiento de la masa corporal: un nuevo método para utilizar en nutrición clínica y medicina deportiva. Apunts: Educación física y deportes; 18:175-87. 1993.

¿Por qué fraccionamiento 5 componentes?

- **Estima masas**
 - Adiposa
 - Muscular
 - Ósea
- **Considera Δ proporciones**
 - Cabeza
 - Longitud tronco/piernas
 - Diámetros caderas, hombros
- **Abordaje matemático**
 - No ecuación de regresión
 - Tri-dimensionalidad de tejidos

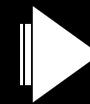
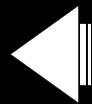


Tri-dimensionalidad de tejidos



Estudios en fútbol: “*tablón y vestuario*”

edad: 15 años
Tanner: 5
37 Kg músculo

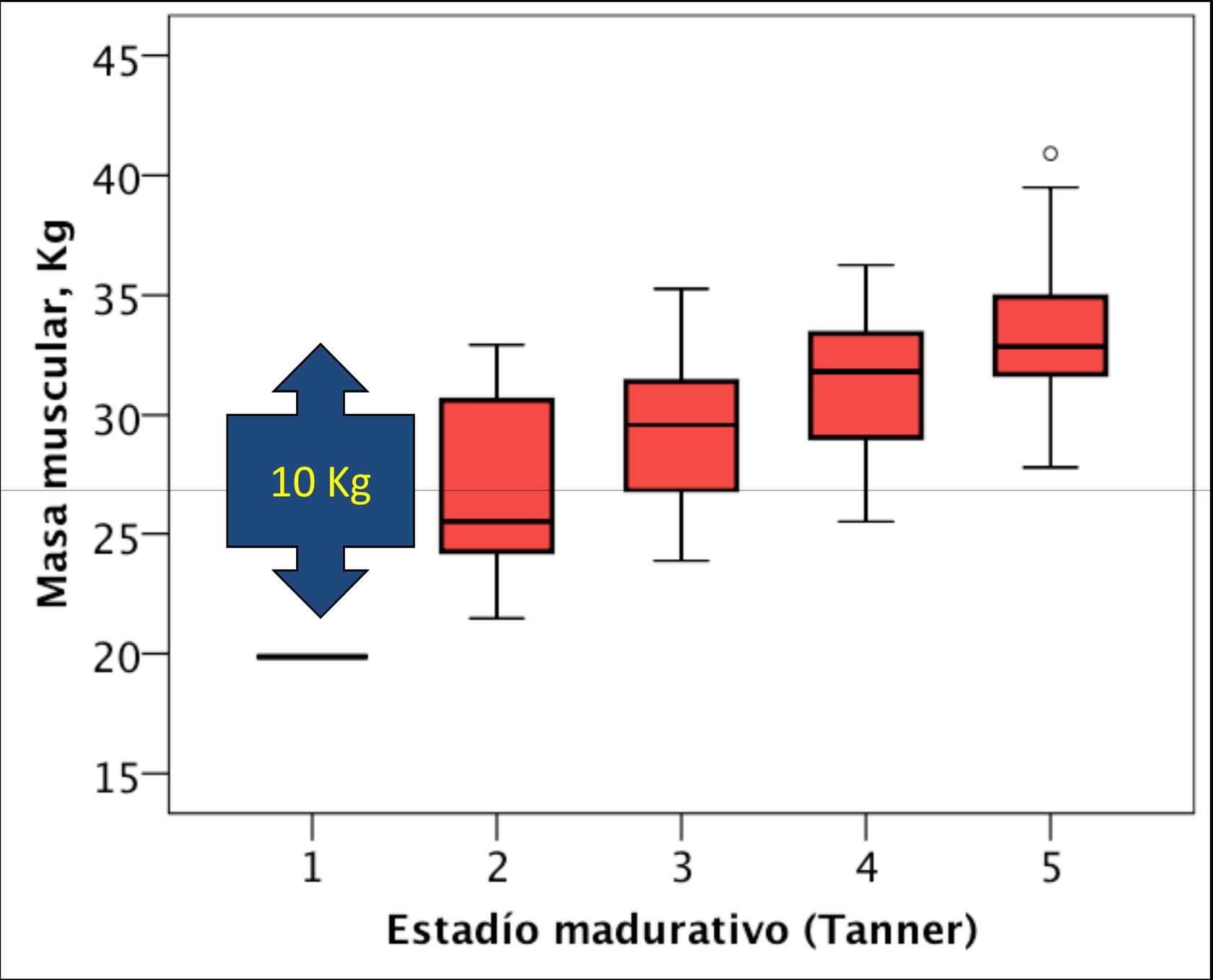


edad: 15 años
Tanner: 1
17 Kg músculo

Divisiones inferiores CABJ 2001



Evaluación antropométrica en 81 jugadores de las divisiones inferiores (9^a, 8^a, y 7^a), Club Atlético Boca Juniors (2001); Holway, F. & Ortega-Gallo, J. *datos sin publicar*.



Evaluación de maduración biológica a partir de medidas antropométricas: edad – peso – talla – talla sentada

- Mirwald, R., Baxter-Jones, A., Bailey, D., & Beunen, G. (2002) *MSSE* 34 (4) 689-694
- Saskatchewan Pediatric Bone Mineral Accrual Study



Proyecto Deporte Social 2004-6

n=817 8-19 años, barrios NBI, gran Bs As



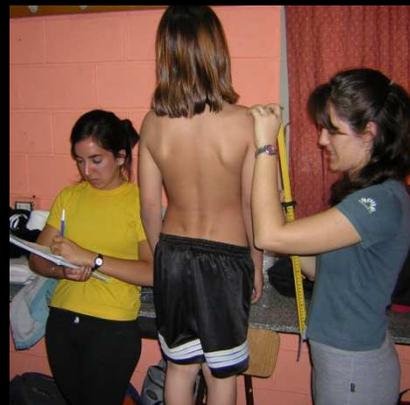
4 básicos



12 perímetros



6 pliegues



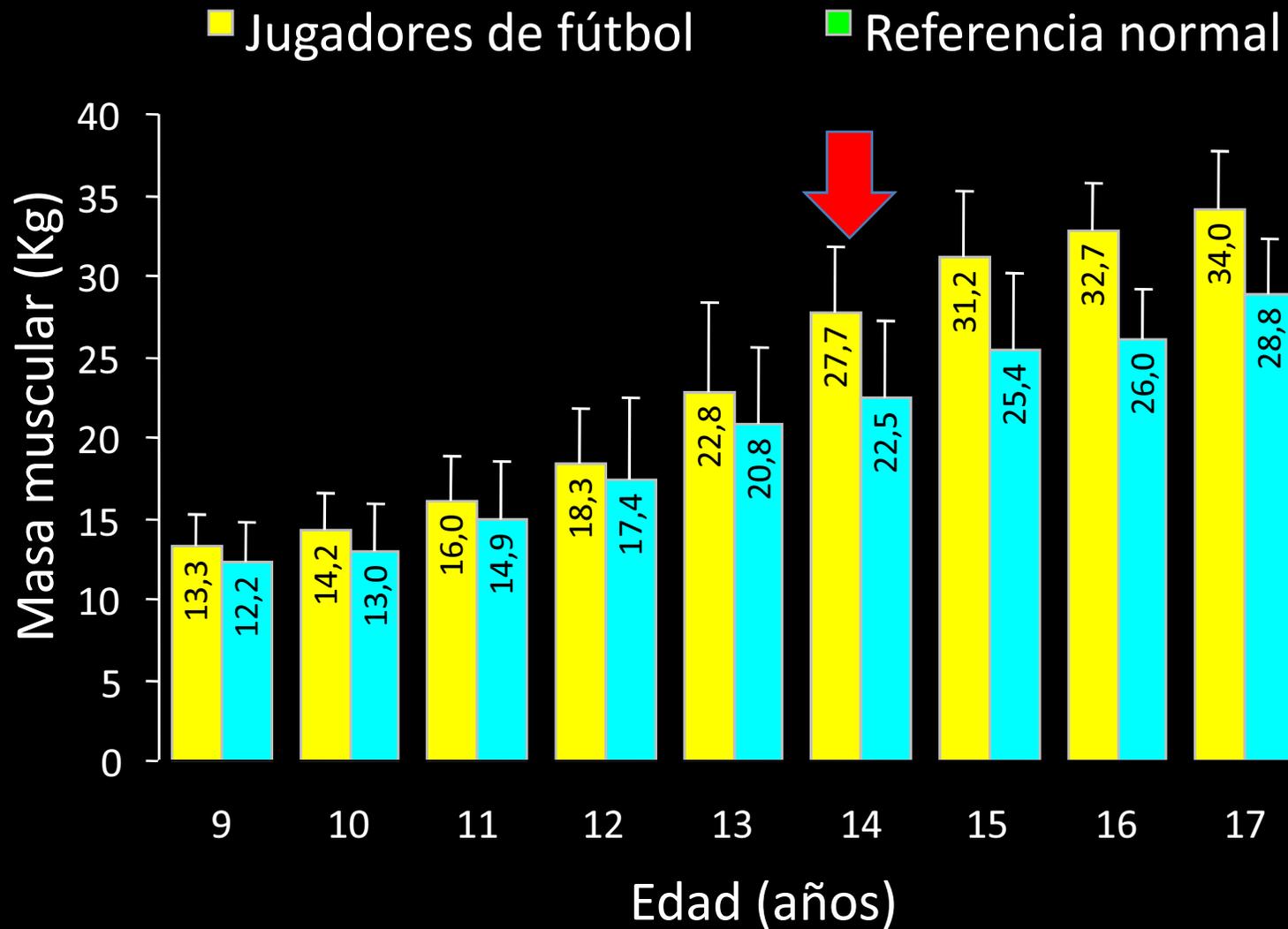
9 longitudes



8 diámetros grandes y pequeños



Masa muscular en fútbol juvenil

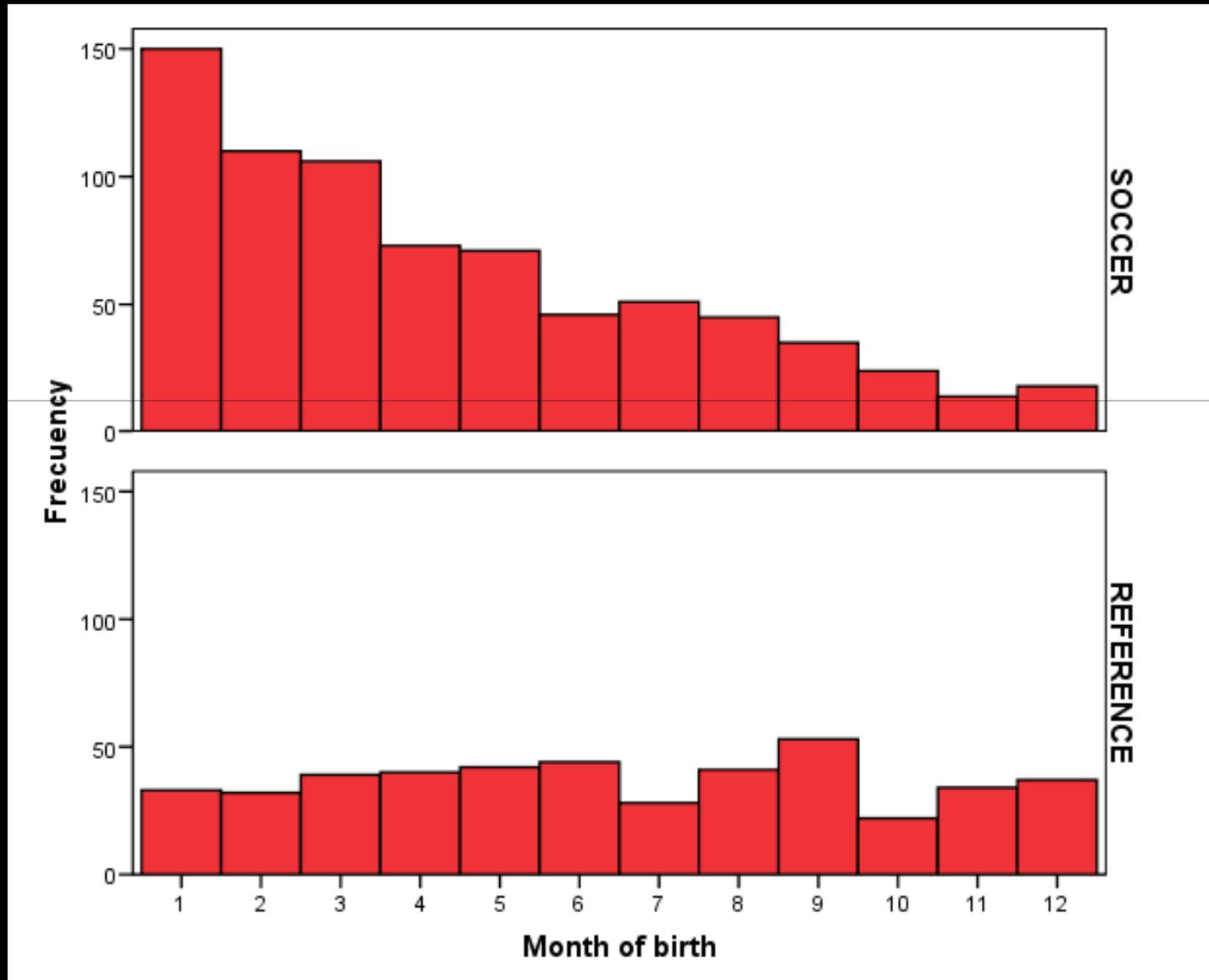


Abordaje LMS para masa muscular (Kg) fútbol infanto-juvenil n=742

$$z\text{-score} = \frac{(\text{observed value} \div M)^L - 1}{L \times S}$$

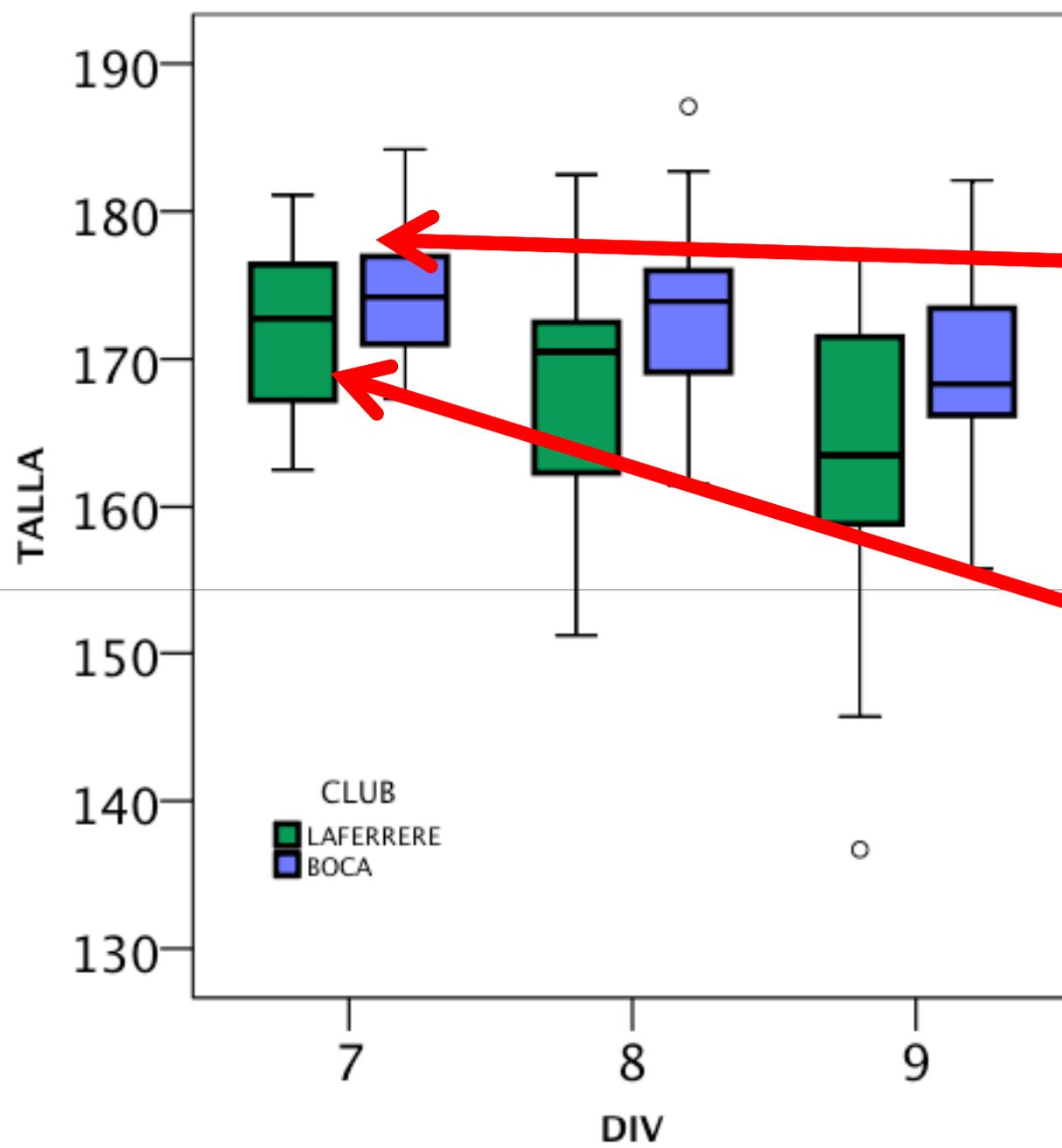
AGE GROUP	5%	15%	25%	50%	75%	85%	95%
8	9,6	10,2	10,5	11,2	11,9	12,2	12,9
9	9,9	10,9	11,6	12,8	14,1	14,9	16,1
10	10,9	12,1	12,9	14,4	16,0	16,9	18,5
11	11,7	13,1	14,0	15,8	17,8	18,9	20,9
12	12,9	14,7	15,9	18,1	20,5	21,9	24,3
13	14,8	17,4	19,2	22,6	26,4	28,6	32,5
14	21,8	23,8	25,1	27,8	30,7	32,4	35,5
15	25,4	27,6	28,9	31,6	34,6	36,3	39,3
16	28,1	29,7	30,7	32,7	34,9	36,1	38,3
17	28,5	30,4	31,6	34,0	36,5	37,9	40,3
18	30,1	32,2	33,4	36,0	38,7	40,3	43,1

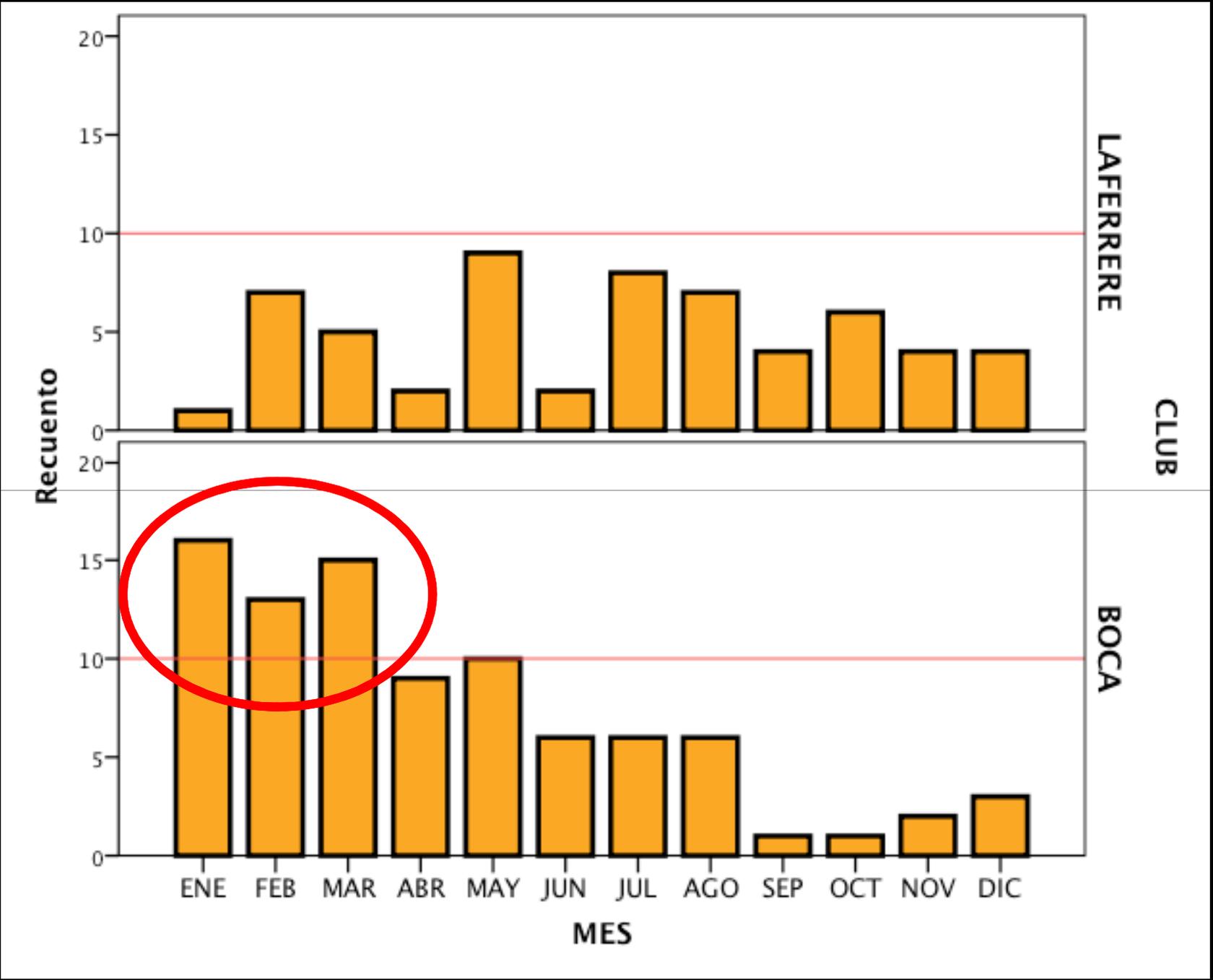
Efecto fecha de nacimiento



Gradientes competitivos







ORIGINAL

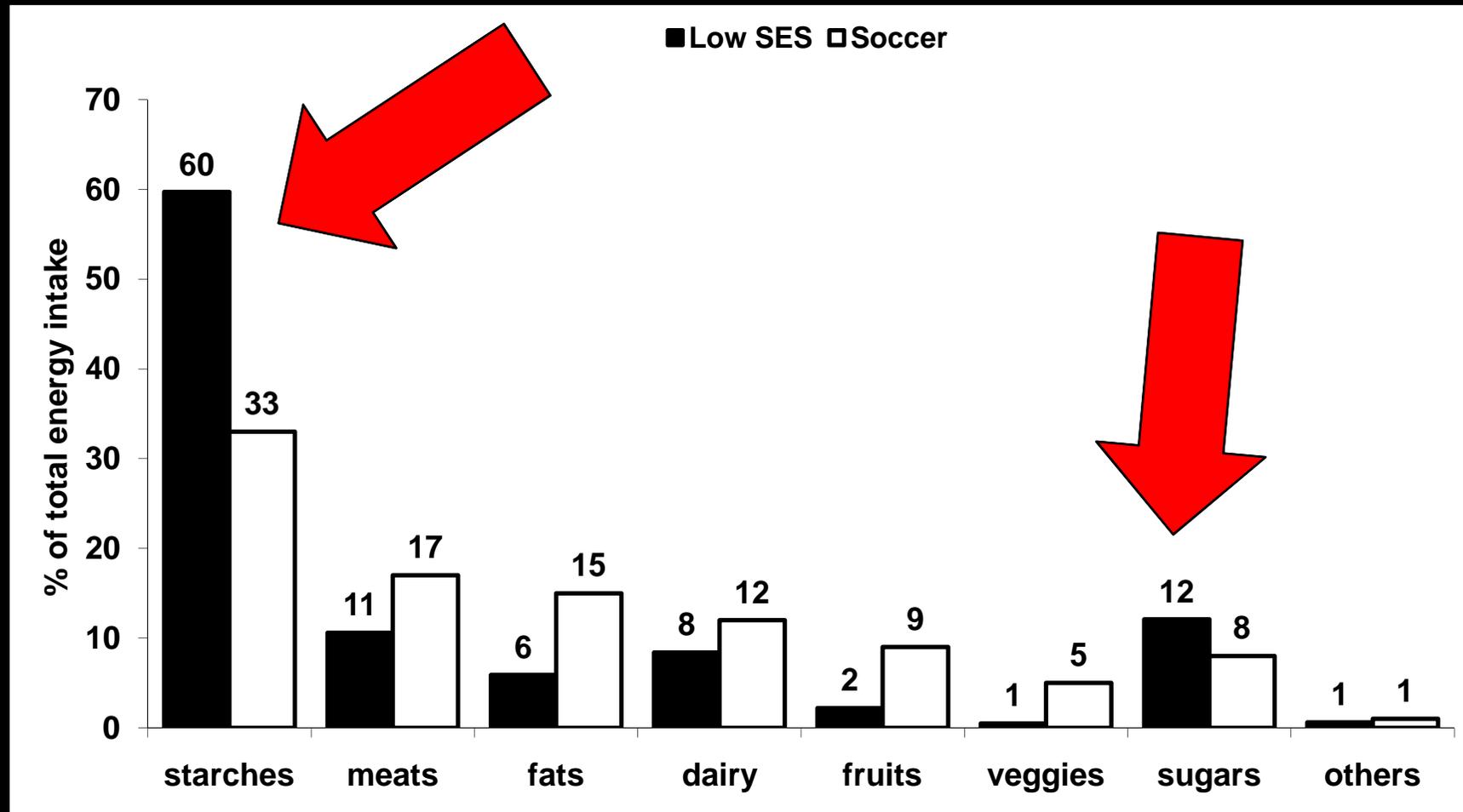
Ingesta nutricional en jugadores adolescentes de fútbol de elite en Argentina

Apunts Med Esport. 2011;46(170):55–63

Francis Holway^{a,*}, Bibiana Biondi^b, Karen Cámara^c y Fernando Gioia^b

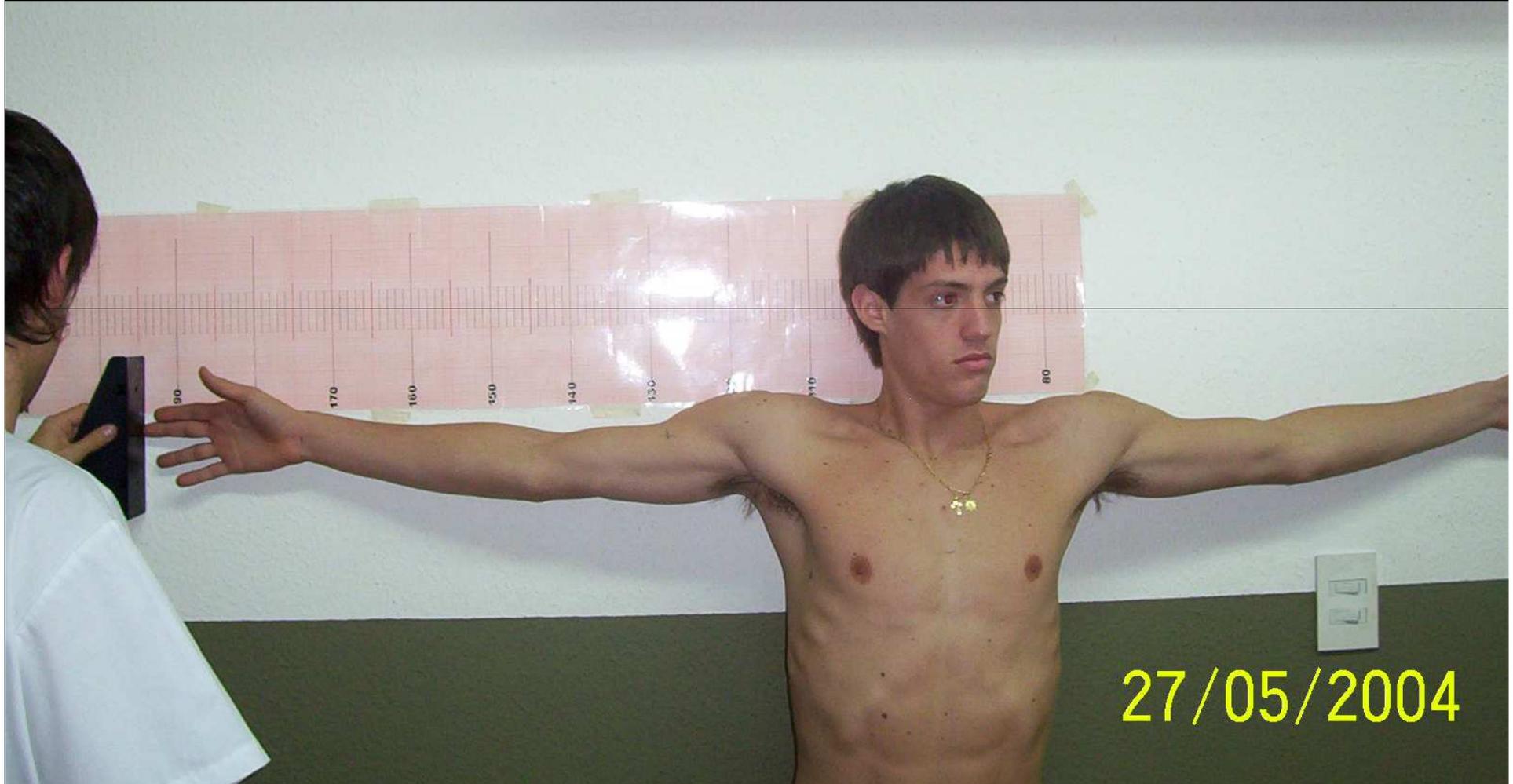


Food intake according to SES group in Buenos Aires Metropolitan Area

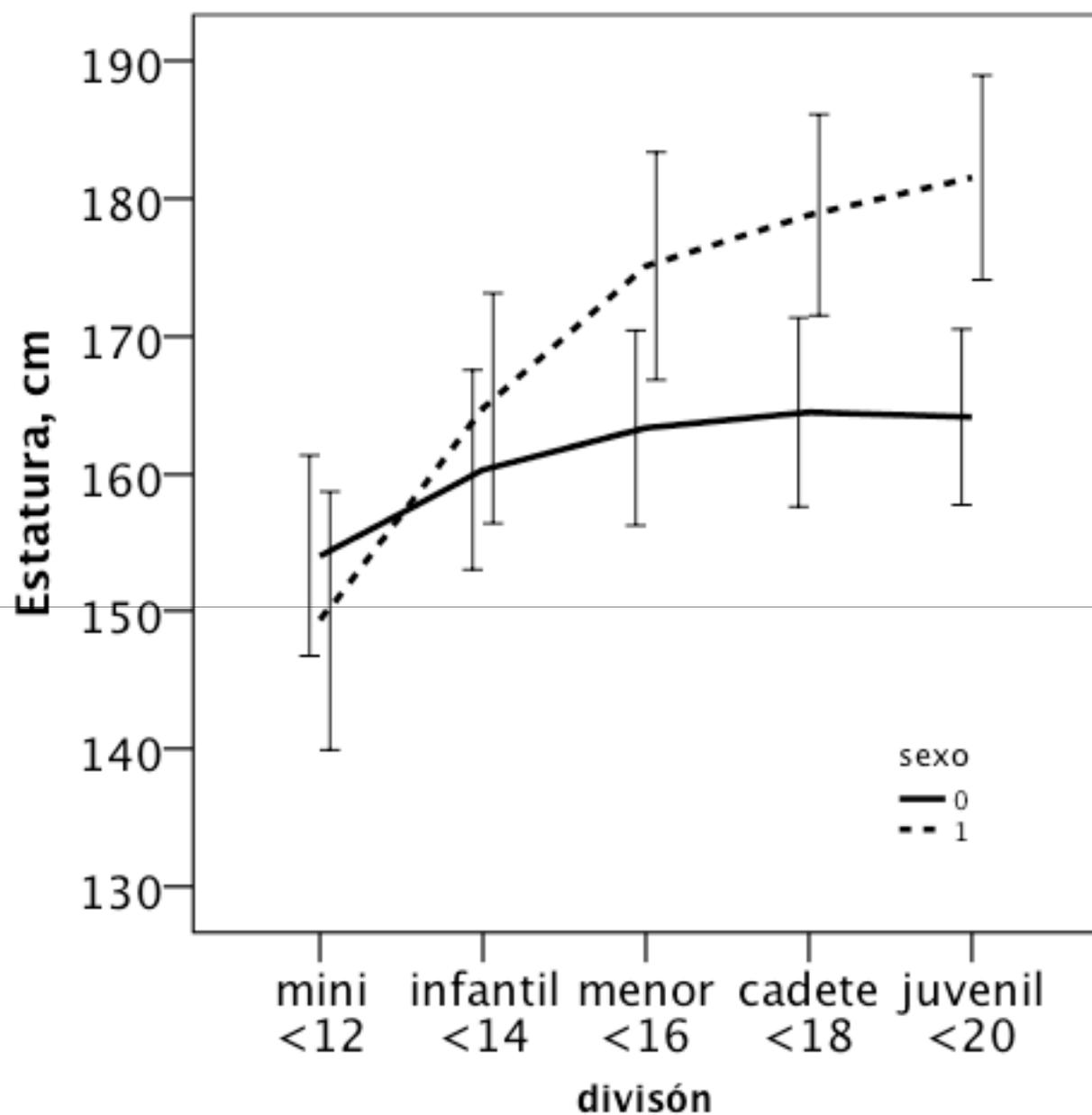


Holway, F. E., Biondi, B., Camera, K., Gioia, F. (2011).
Nutritional intake of adolescent elite soccer players in Argentina.
Apunts Medicina de l'Esport, 46(170) 55-63.

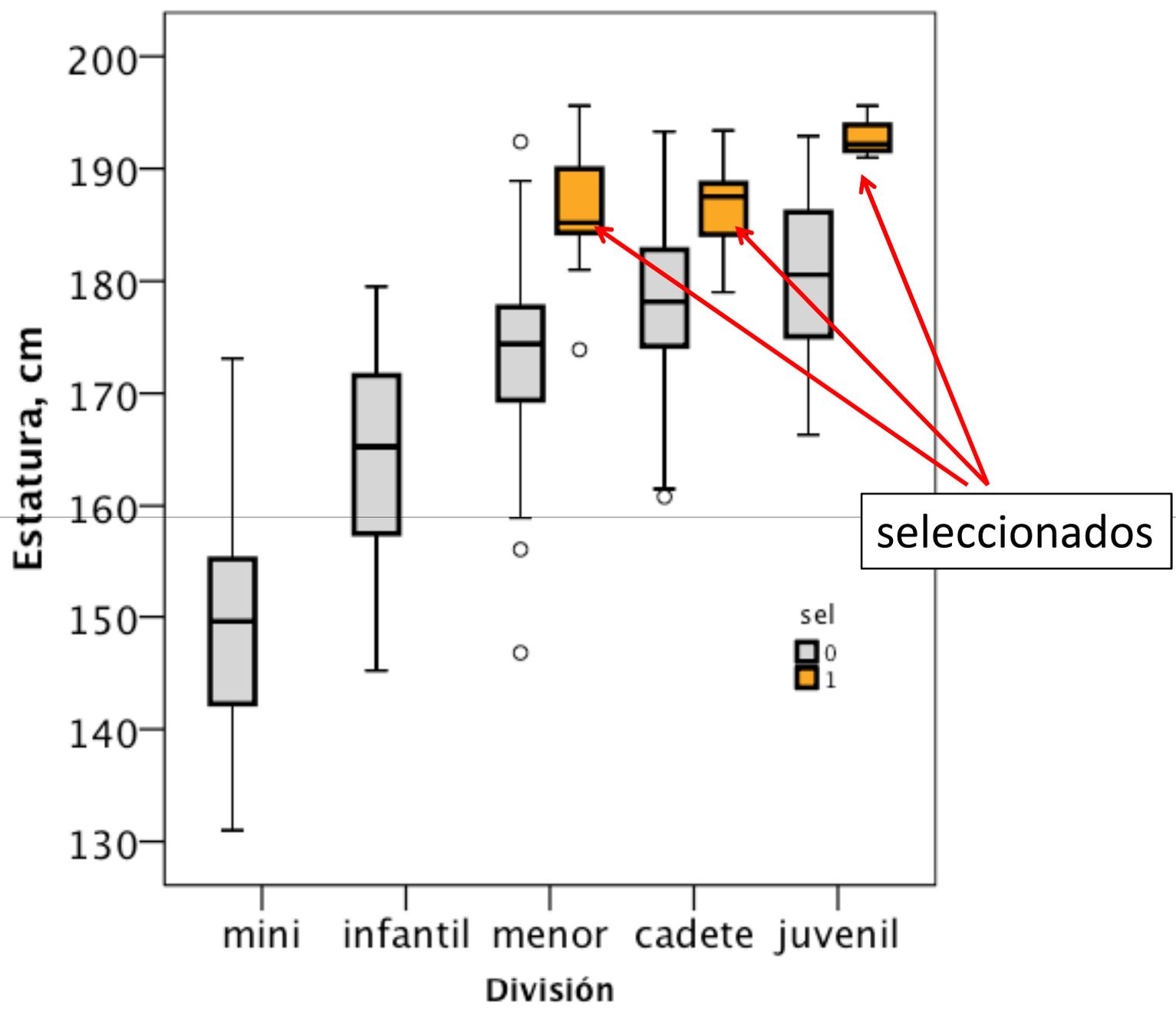
Federación Metropolitana Voleibol (n = 326 niñas & 362 niños; 10-20 años)



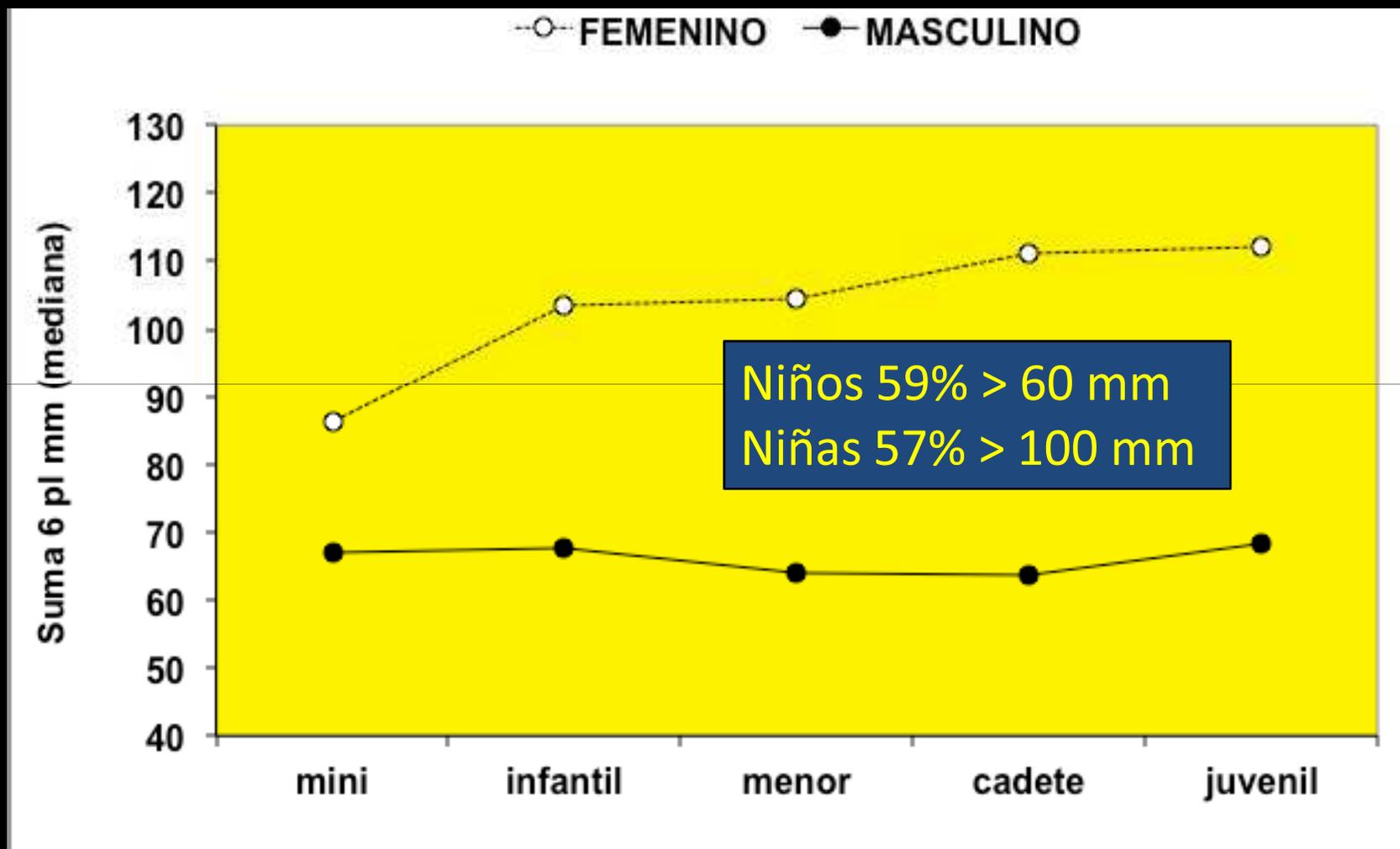
Forchino, F., Peretti, A. & Holway, F. (2005) datos sin publicar



Barras de error: +/- 1 DT



Suma de 6 pliegues (mm) FMV n=688



Estudios en rugby



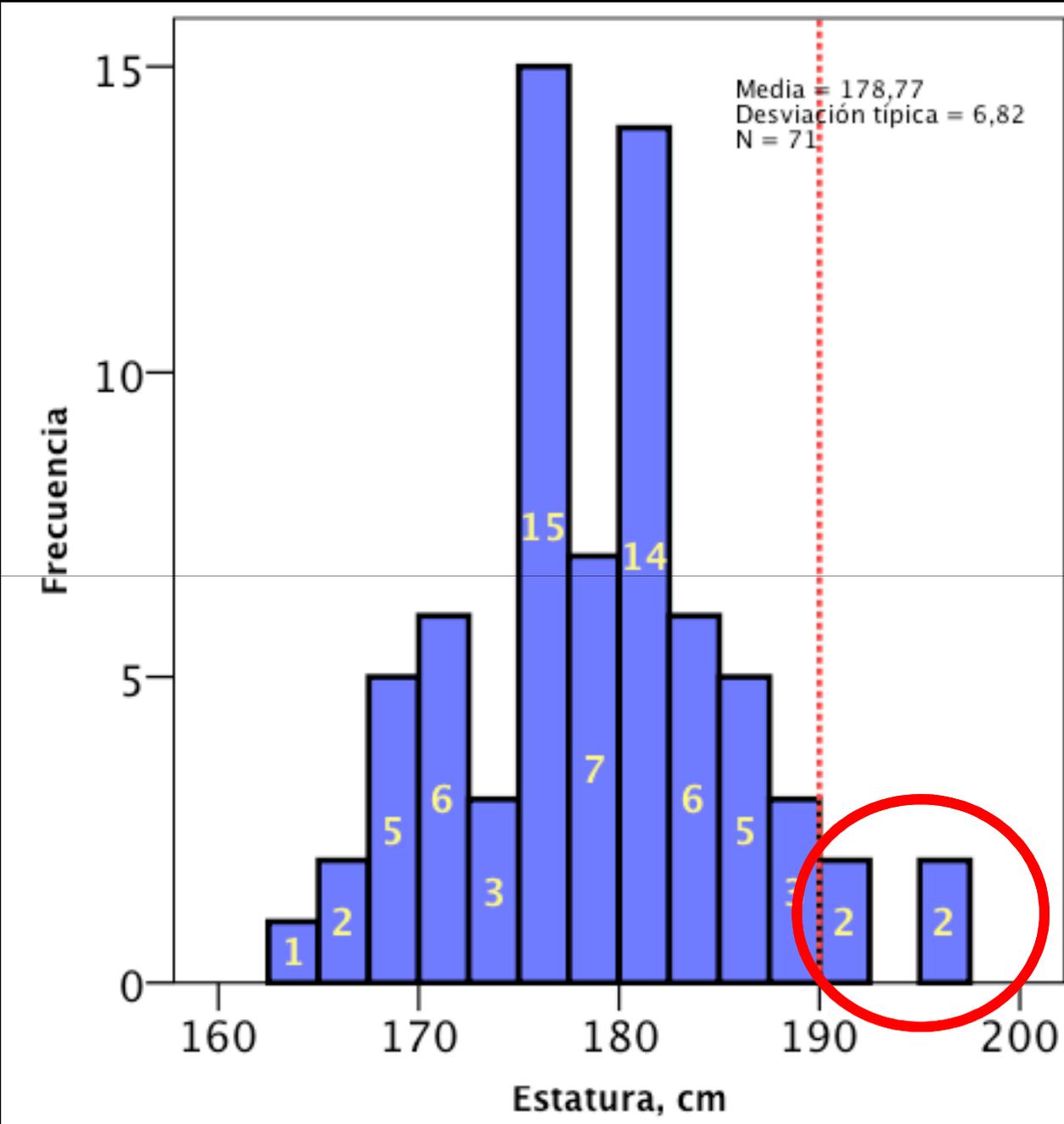
Rugby infanto-juvenil



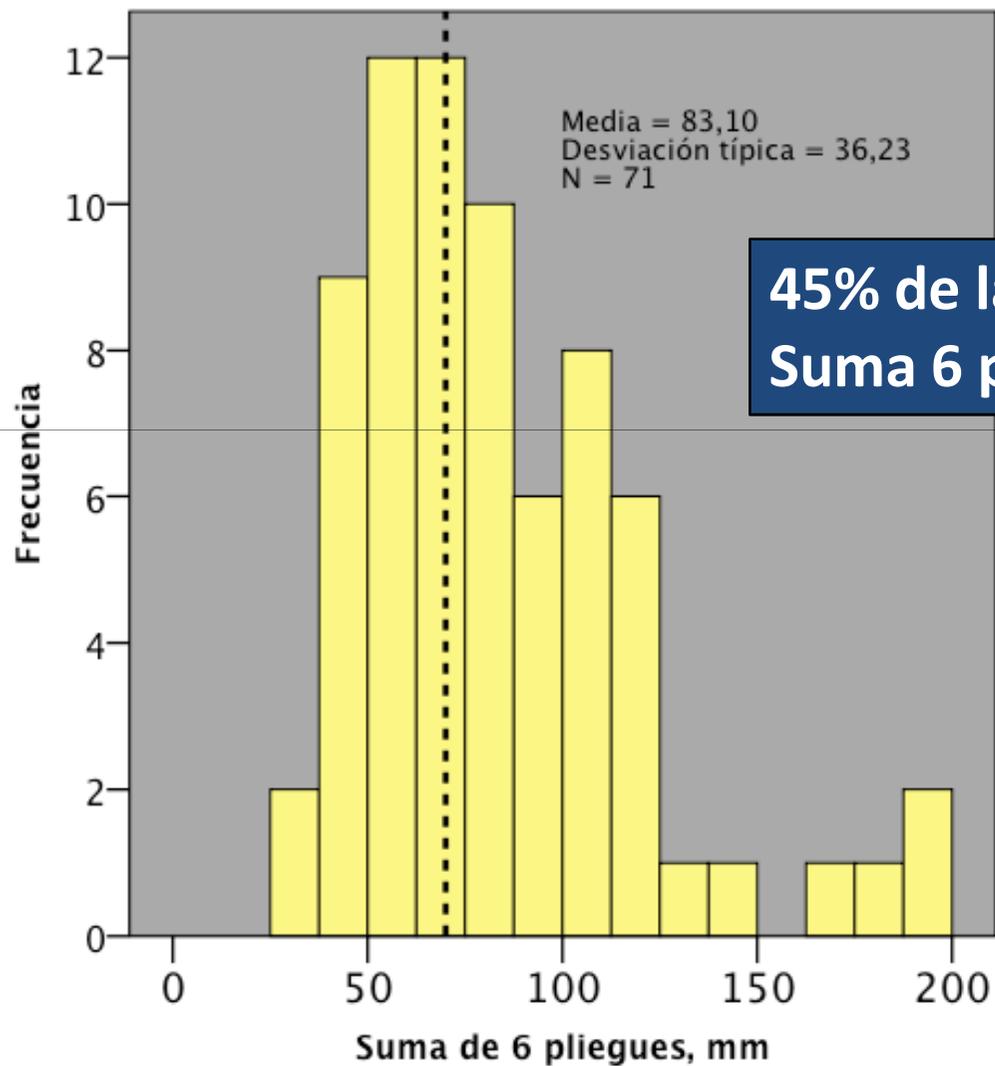
Rugby pre-sel sub-18 (2008) n=71



Du Mont, M., Peretti, A. & Holway, F. (2009) datos sin publicar



Rugby: Pre-seleccionado sub-18



Kinanthropometry of world champion junior male field hockey players

Francis E. Holway^{a,*}, Mariano Seara^b

Apunts Med Esport. 2011;46(172):163–168

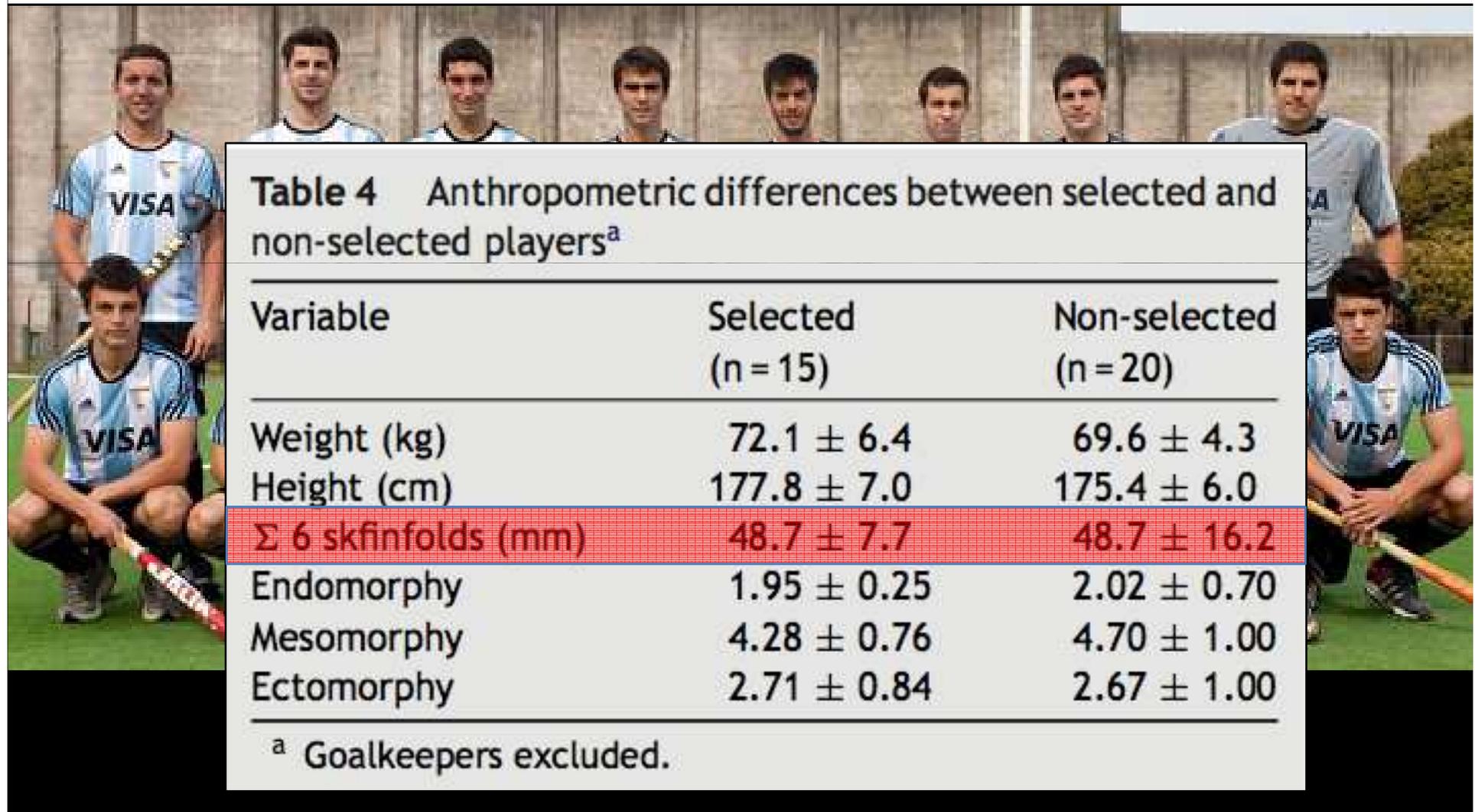


Table 4 Anthropometric differences between selected and non-selected players^a

Variable	Selected (n = 15)	Non-selected (n = 20)
Weight (kg)	72.1 ± 6.4	69.6 ± 4.3
Height (cm)	177.8 ± 7.0	175.4 ± 6.0
Σ 6 skinfolds (mm)	48.7 ± 7.7	48.7 ± 16.2
Endomorphy	1.95 ± 0.25	2.02 ± 0.70
Mesomorphy	4.28 ± 0.76	4.70 ± 1.00
Ectomorphy	2.71 ± 0.84	2.67 ± 1.00

^a Goalkeepers excluded.

ORIGINAL ARTICLE

Predictive ability of anthropometry and maturation parameters on rowing ergometer performance in inexperienced adolescents

Francis E. Holway^{a,*}, Guillermo Guerci^b

Apunts Med Esport. 2012;47(175):99-104



$$\text{Corrected performance time (s)} = 270.3 - 0.606 \times \text{arm span (cm)}$$

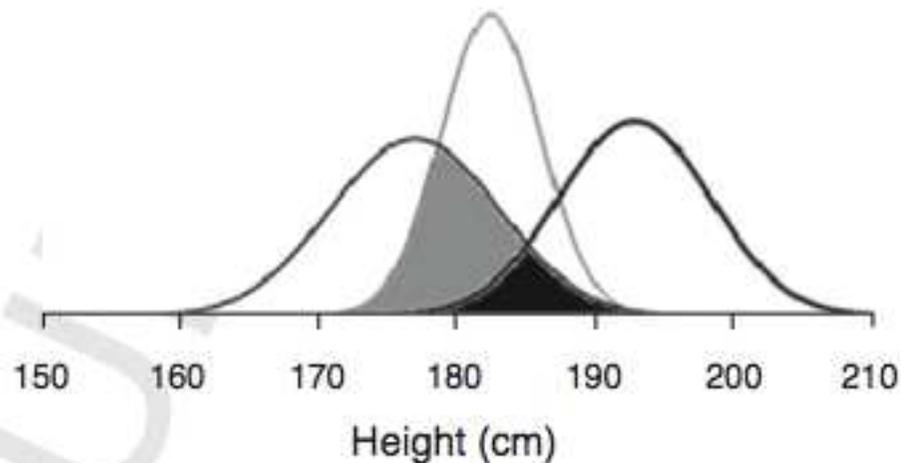
$$r = 0.488, \quad p < 0.001; \quad R^2 = 0.224; \quad \text{SEE} = 8.6$$

a

Boys

Overlap zone vs. Ltwt R = 54.2%
Overlap zone vs. Opwt R = 17.3%

—Boys — M LWT R — M OPWT R

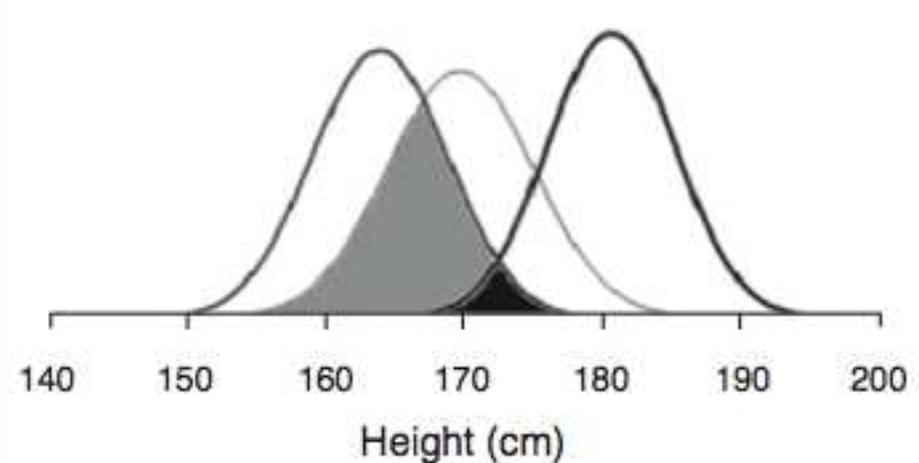


b

Girls

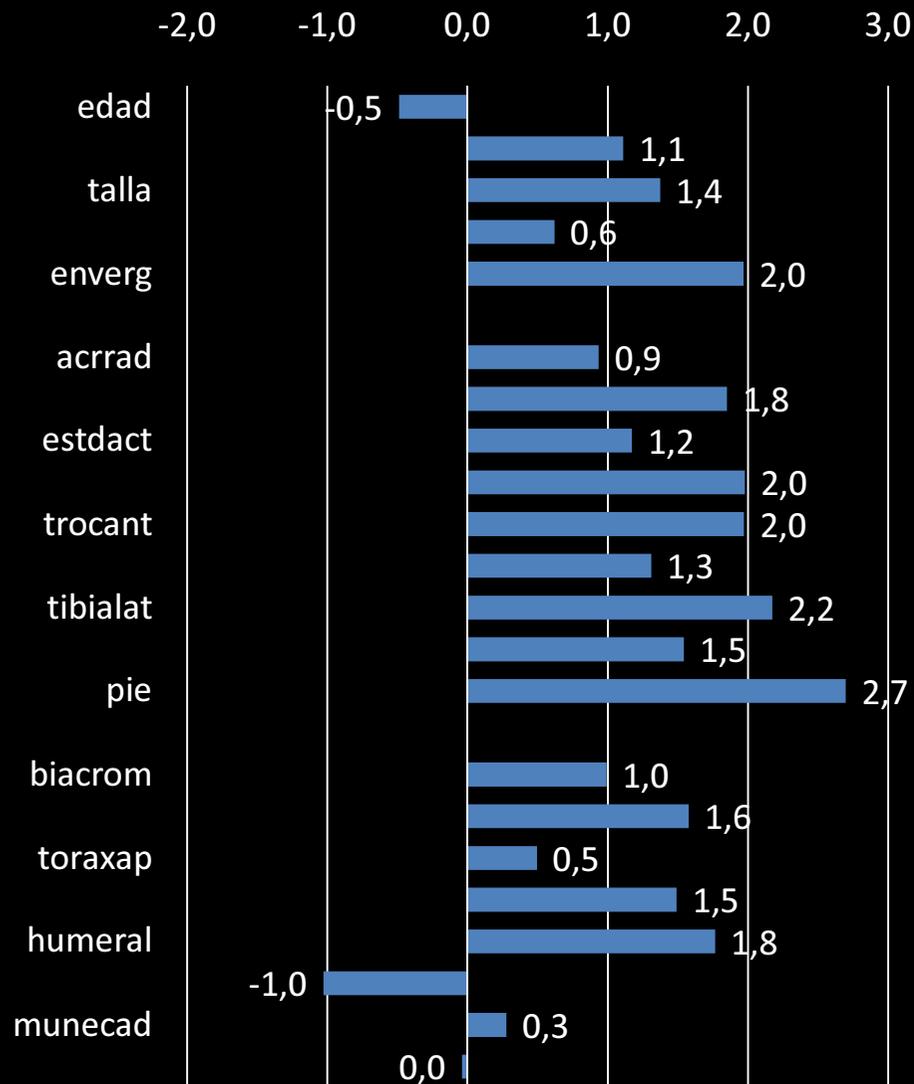
Overlap zone vs. Ltwt R = 56.9%
Overlap zone vs. Opwt R = 7.9%

—Girls — F LWT R — F OPWT R



Uso de proporcionalidad

puntuación-Z proporcionalidad



En resumen

- Antropometría
 - Herramienta útil, versátil, bajo costo
 - Permite interacción entre disciplinas
 - Necesidad de estandarizar
- Evaluaciones en niños deportistas
 - Generan referencias x gradiente competitivo
 - Ilustran presiones de selección
 - Efectos de la práctica deportiva
 - Pueden ayudar a tomar decisiones

FEDERACIO CATALANA
DE FUTBOL

15 FEB. 2002



TEMPORADA: 2001-2002

Nom del jugador **LIONEL ANDRES**

1r. Cognom **MESSI**

2n. Cognom

Club **FUTBOL CLUB BARCELONA**



Signatura del jugador

Núm.

Data de naixement

1	0	0	1	2	4	0	6	1	9	8	7
---	---	---	---	---	---	---	---	---	---	---	---

DNI Núm.

NIF

X **3643728** # **E**

50104011

Lionel Messi

Gracias x su atención

fholway@gmail.com