NICHE

Nutrition Innovation Centre for Food & Health

Nutrition Knowledge and Dietary Intakes of Team Sports Athletes.

Dr Pamela Magee

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‘Global Excellence in Nutrition Research & Education’

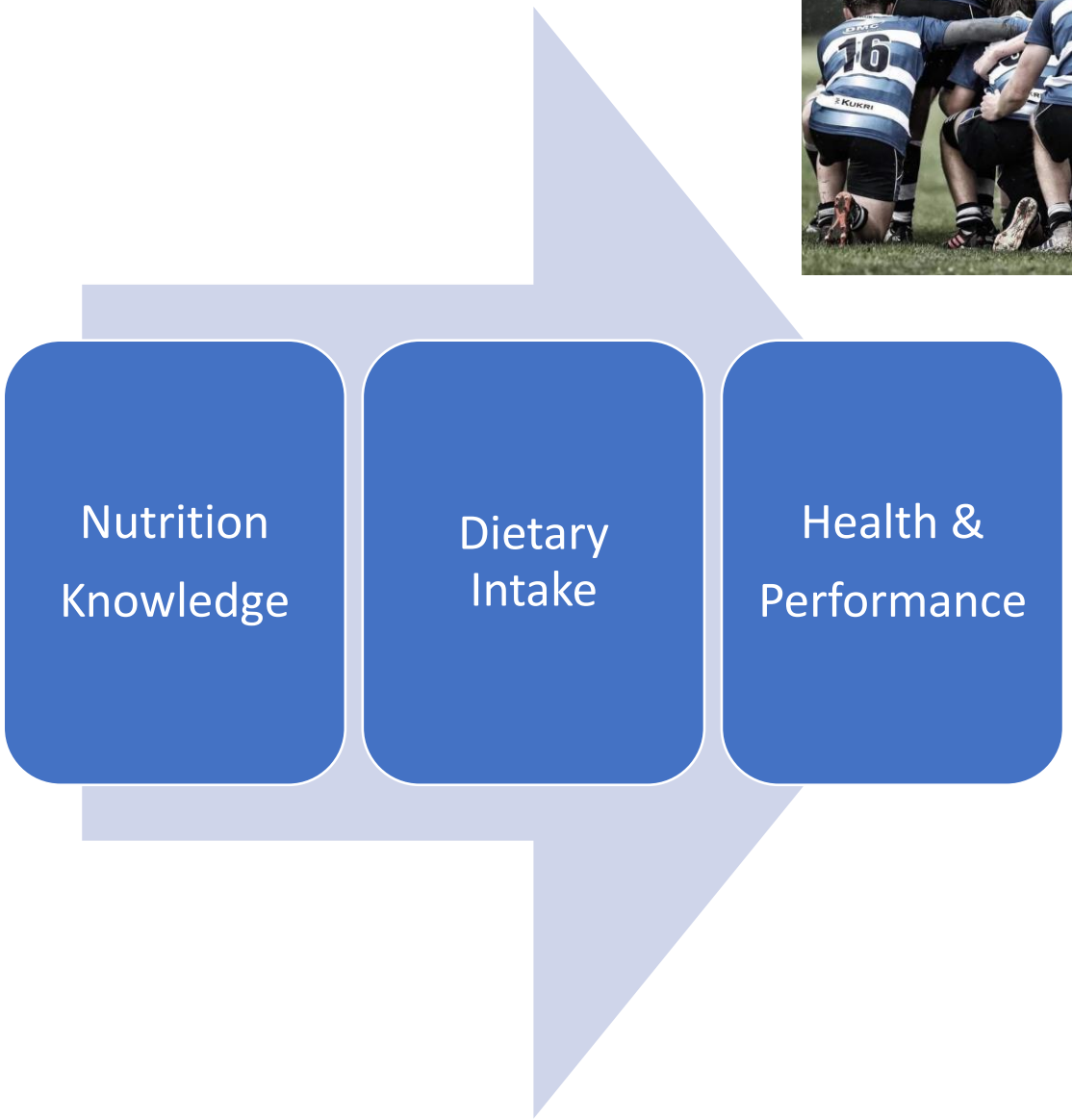
Overview

- Background
- Nutritional knowledge and dietary intake of Gaelic and rugby players
- Vitamin D intake/status in players
- Conclusions
- Future Work

Nutrition and Performance

“ *…aside from the limits imposed by heredity and the physical improvements associated with training, no factor plays a bigger role in exercise performance than does* ***nutrition***”

(Costill 1988. Int J Sports Med 9, 1-18.)



Nutrition Knowledge of Team Sports Athletes

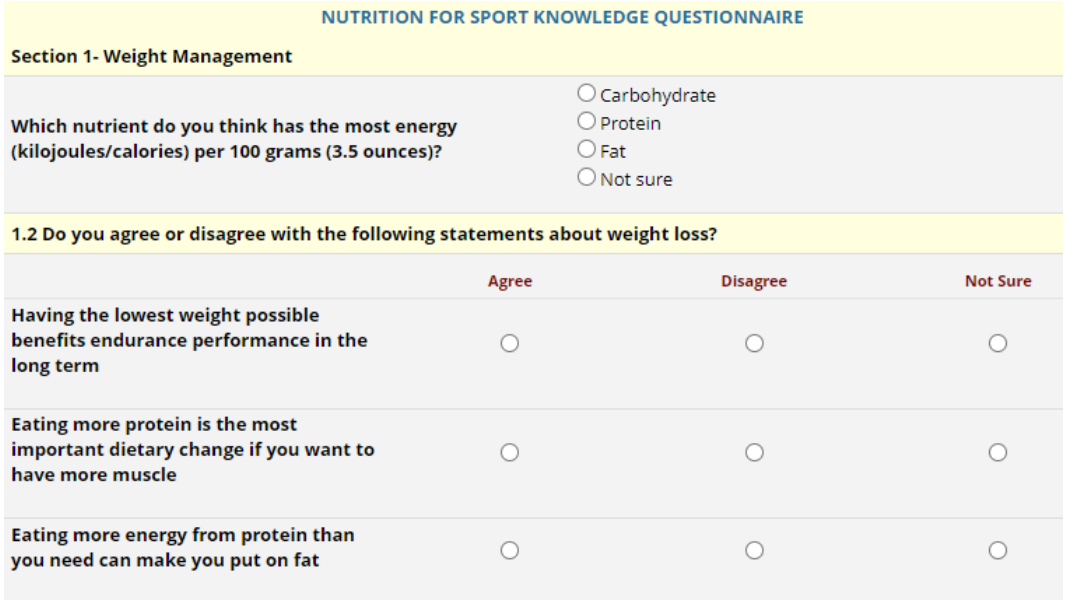
Author/Year	Gender	Sport, sample size	Method	Mean Nutrition Knowledge score (%)
Alaunyte et al. 2015	male	Professional rugby league players (n=21)	General NKQ	72.82 ± 6.11
Devlin et al. 2016	male	Australian football: elite (n=15), sub-elite (n=33) elite soccer (n=18)	General NKQ and sport-specific tool	71.6 ± 11.6 69.9 ± 12.9 68.4 ± 10.5
Trakman et al. 2018	male	Australian football: elite (n=46), non-elite (n=53)	Nutrition for Sport Knowledge Questionnaire (NSKQ)	45.5 ± 14.7 50.9 ± 11.0
Condo et al. 2019	female	Elite Australian rules football (n=30)	Sports Nutrition Knowledge Questionnaire	54.5% (median)
Renard et al. 2020	female	GAA (football and Camogie) (n=328)	Abridged NSKQ	46.0 ± 11.8
O'Brien et al. 2021	male	Elite Gaelic footballers (n=100)	NSKQ	47.6 ± 12.3
Renard et al. 2022	male	Gaelic footballers: sub-elite (n=68), elite (n=84)	Abridged NSKQ	44.2% 44.3%

NKQ = nutrition knowledge questionnaire; NSKQ = nutrition for sport knowledge questionnaire

Is dietary intake influenced by nutritional knowledge in athletes?

- In professional rugby league players, those with ‘poor’ knowledge consumed starchy and fibrous foods only occasionally. Nutritional knowledge was positively correlated with fruit and veg consumption (Alaunyte et al. 2015).
- In a recent systematic review weak-to-moderate positive associations were found between NK and positive dietary behaviours (Janiczak et al. 2022).

Assessing Nutritional Knowledge and Dietary Intake of Team Sport Athletes.



NUTRITION FOR SPORT KNOWLEDGE QUESTIONNAIRE

Section 1- Weight Management

Which nutrient do you think has the most energy (kilojoules/calories) per 100 grams (3.5 ounces)?

- Carbohydrate
- Protein
- Fat
- Not sure

1.2 Do you agree or disagree with the following statements about weight loss?

	Agree	Disagree	Not Sure
Having the lowest weight possible benefits endurance performance in the long term			
Eating more protein is the most important dietary change if you want to have more muscle			
Eating more energy from protein than you need can make you put on fat			

Inclusion criteria:

- Gaelic/football/rugby players (non-professional)
- Aged 18-40 years
- Training at least twice weekly

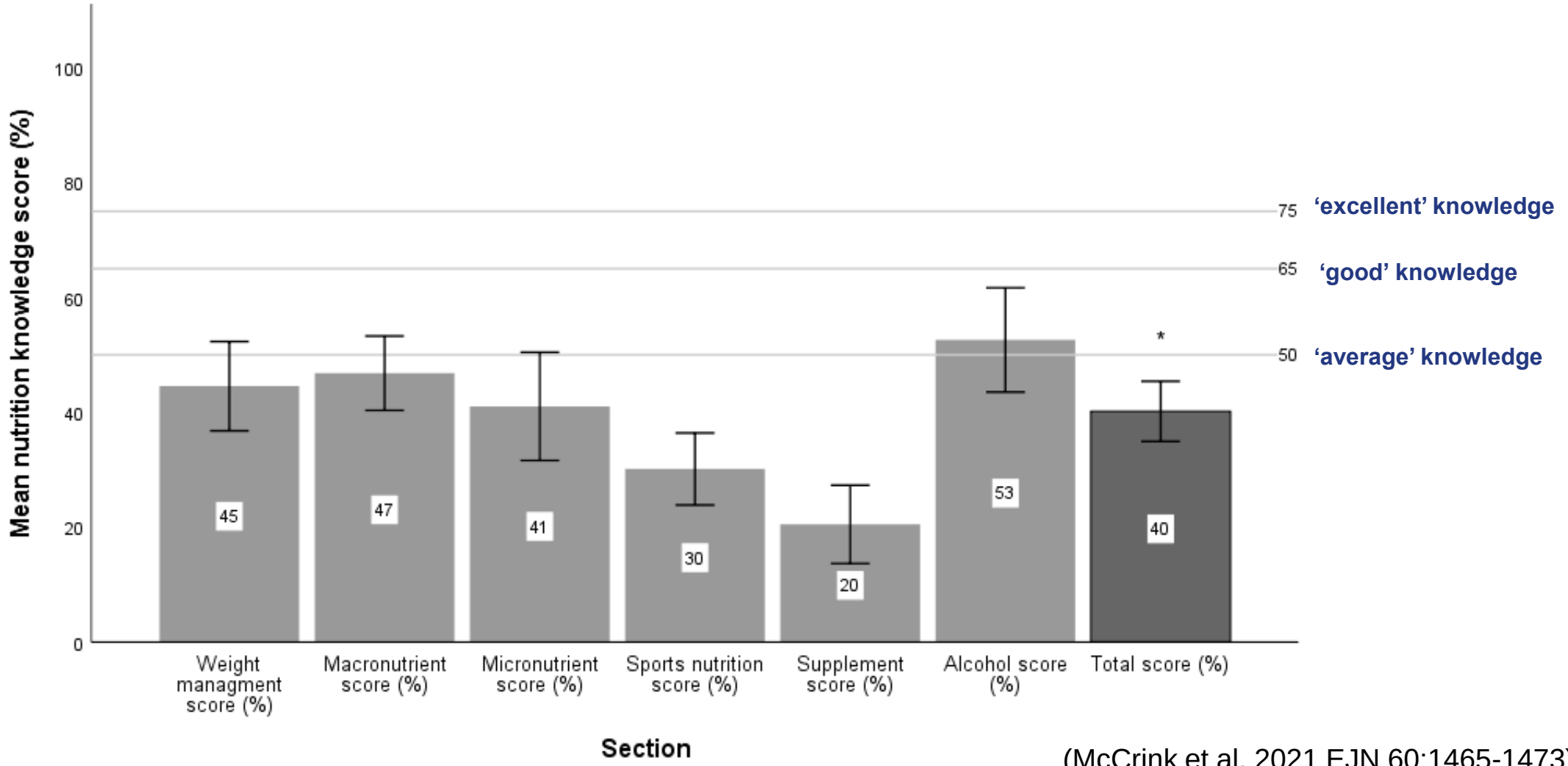
Methods:

- Nutrition knowledge assessed using validated Nutrition for Sport Knowledge Questionnaire (NSKQ) (Trakman et al. 2017, 2019)
- Dietary intake assessed via 4-day semi-quantitative food diary
- Ethical approval (UU: FCBMS-19-017, REC/14/0021 and IRFU: Ref: 03-21)

NSKQ sections:

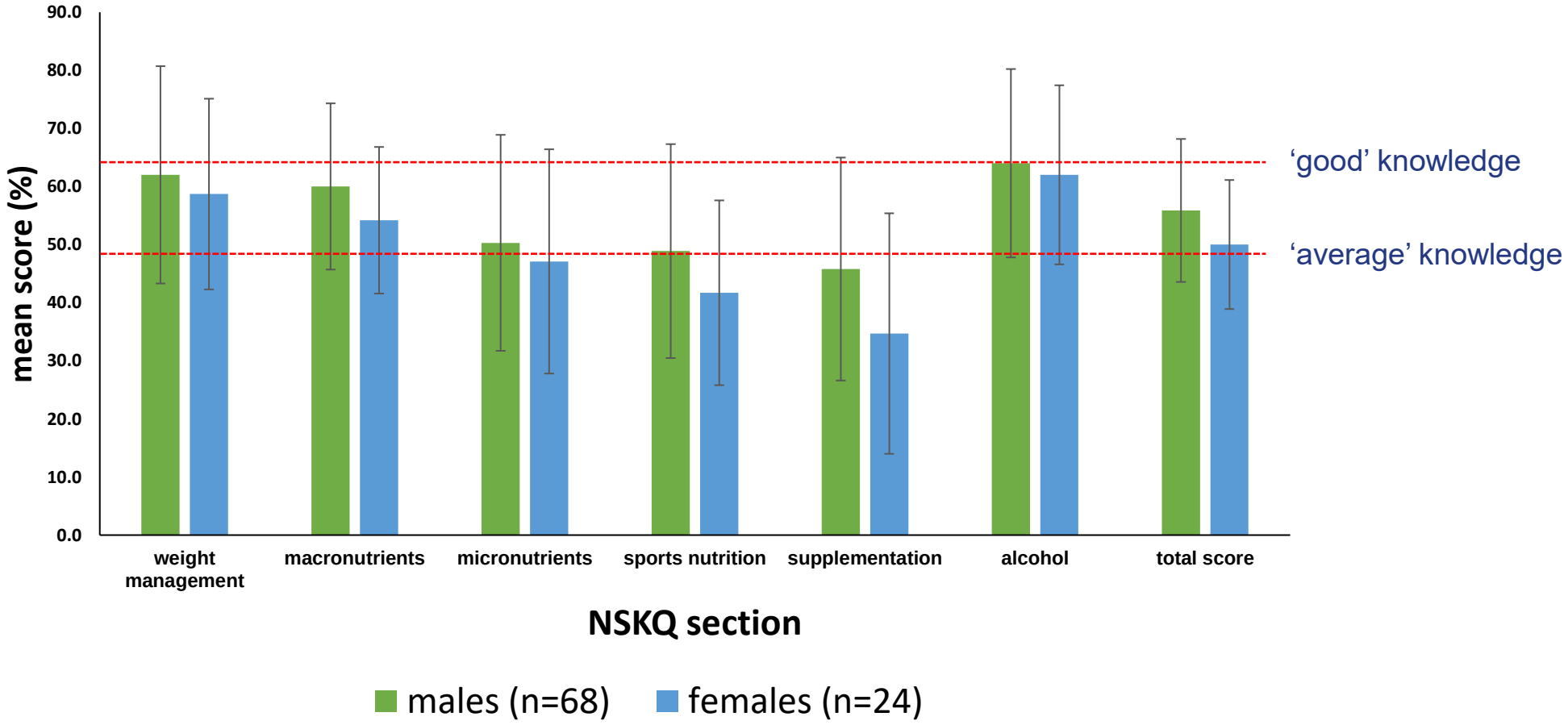
- Weight management (12)
- Macronutrients (30)
- Micronutrients (13)
- Sports nutrition (12)
- Supplementation (12)
- Alcohol (8)

Nutritional Knowledge of Male Gaelic Footballers.



(McCrink et al. 2021 EJN 60:1465-1473)

Nutritional Knowledge of Rugby Players.



Nutritional Knowledge of Team Sport Players.

Section	Elite AF (n=46)[1] Mean ± SD (%)	Non-elite AF (n=53)[1] Mean ± SD (%)	Elite Gaelic Footballers[2] (n=100) Mean ± SD (%)
Total score	45.5 ± 14.7	50.9 ± 11.0	47.6 ± 12.3
Weight management	48.3 ± 18.0	56.7 ± 17.8	54.4 ± 10.1
Macronutrients	57.0 ± 17.3	58.9 ± 15.3	52.8 ± 10.0
Micronutrients	38.8 ± 18.8	49.9 ± 16.3	34.2 ± 11.9
Sports nutrition	46.5 ± 22.2	46.0 ± 14.7	42.3 ± 13.4
Supplements	27.7 ± 16.6	34.3 ± 19.1	39.4 ± 14.0
Alcohol	52.4 ± 22.9	70.5 ± 17.0	57.9 ± 10.0

[1]Trackman et al. 2018, [2]O'Brien et al. 2021

Supplement Use in Gaelic Footballers

Male Players (n=33)

- 85% used supplements within last 6 months
- 3 most popular supplements:
  - Sports drinks
  - Whey protein
  - caffeine

Female Players (n=34)

- 53% used supplements within last 6 months
- 3 most popular supplements:
  - Multivitamins
  - Sports drinks
  - Whey protein

Would like more information on:

- Dose
- Effectiveness of supplements
- Benefits/risks

Reasons for Use

Nutrient content of semi-skimmed milk vs carbohydrate sports drinks (per 100 ml)

0.44-0.88 £/L

Energy (kcal)	10-28
Protein (g)	0.0
Carbohydrate (g)	2-6.5
Fat (g)	0.0
Sodium (mg)	35-51
Calcium (mg)	0-37

0.55-2.00 £/L

Lewis et al. 2019. Eur J Sports Sci 19:40-48

Dietary Intakes of Gaelic footballers and rugby players.

Nutrient	DRV/SNR	Intake: Median(IQR) Gaelic (male, n=62)[1]	Rugby (male, n=28)	Rugby (female, n=9)
Energy (kcals)	/	2496.2 (2162.2, 2719.1)	2049.9 (1596.4, 2618.1)	1954.0 (1474.0, 2117.0)
Carbohydrate (g) g/kg/d	5-7	290.7 (234.1, 319.2) 3.6 (3.0, 4.1)*	214.4 (183.5, 293.4) 2.5 (2.2, 3.4)*	181.0 (169.0, 219.0) 2.6 (2.1, 3.1)*
Protein (g) g/kg/d	1.2-2	114.2 (96.4, 125.2) 1.4 (1.2, 1.7)	91.7 (74.3, 134.6) 1.2 (0.8, 1.8)	81.0 (74.0, 98.0) 1.1 (1.0, 1.6)
Fibre (g)	≥ 30	21.5 (18.5, 25.8)*	17.8 (14.1, 22.9)*	17.4 (11.5, 28.4)*
Calcium (mg)	700	1080.9 (812.4, 1420.6)	753.0 (490.5, 1193.6)	680.0 (571.0, 813.0)
Iron (mg)	8.7(M) 14.8 (F)	14.1 (11.6, 17.5)	8.2 (5.8, 12.8)	7.0 (4.9, 8.0)
Vitamin D (mcg)	10	3.8 (1.8, 5.5)*	1.7 (1.1, 2.5)*	2.1 (1.2, 3.0)*

*DRV: dietary reference value, SNR: sports nutrition recommendation based on Thomas et al. 2016; [1]McCrink et al. 2021; *significantly lower than DRV/SNR (one-sample Wilcoxin Signed Rank Test; $p < 0.05$)*

Carbohydrate Intakes in Team Sport Athletes

Sport	Carbohydrate Intake (g/kg/d)	Reference
Gaelic football (male) (n=20)	Pre-season: 3.2 ± 0.82 In-season: 3.4 ± 0.79	McGuire et al. 2022
Gaelic football (male) (n=45)	3.7 ± 1.42	Ó Catháin et al. 2020
Rugby Union (female) (n=15)	3.38 ± 0.36	Traversa et al. 2022
Rugby Union (male)	2.6-6.5	Black et al. 2018

Carbohydrate Intake Stratified by Nutritional Knowledge in Rugby Players

Nutritional Knowledge (based on NSKQ score)	n	CHO intake (g/kg/d)
Poor (0-49%)	13	2.20 ± 0.79
Average (50-64%)	14	2.79 ± 0.84
Good (65-75%)	7	3.23 ± 1.32
Excellent (>75%)	3	4.43 ± 1.01*

** Significantly higher vs. 'poor' (p=0.03) and 'average' knowledge (p=0.046); one-way ANOVA with Tukey post-hoc analysis*

Vitamin D

Limited food sources that are rich in vitamin D.

Vitamin D is made in skin following exposure to sunlight but in the UK/Ireland this only happens during April – September.

10 mcg daily supplement recommended for all adults, especially during autumn & winter.

Vitamin D status

Status measure: circulating concentration of 25-hydroxyvitamin D [25(OH)D]

Deficient:	25(OH)D < 25 nmol/L
Insufficient:	25(OH)D 25 - 50 nmol/L
Sufficient:	25(OH)D > 50 nmol/L

(SACN 2016; NICE 2022)

Eur J Nutr
DOI 10.1007/s00394-016-1202-4

ORIGINAL CONTRIBUTION

Vitamin D_3 supplementation using an oral spray solution resolves deficiency but has no effect on VO_2 max in Gaelic footballers: results from a randomised, double-blind, placebo-controlled trial

Joshua J. Todd[1] · Emeir M. McSorley[1] · L. Kirsty Pourshahidi[1] · Sharon M. Madigan[2] · Eamon Laird[3] · Martin Healy[4] · Pamela J. Magee[1]

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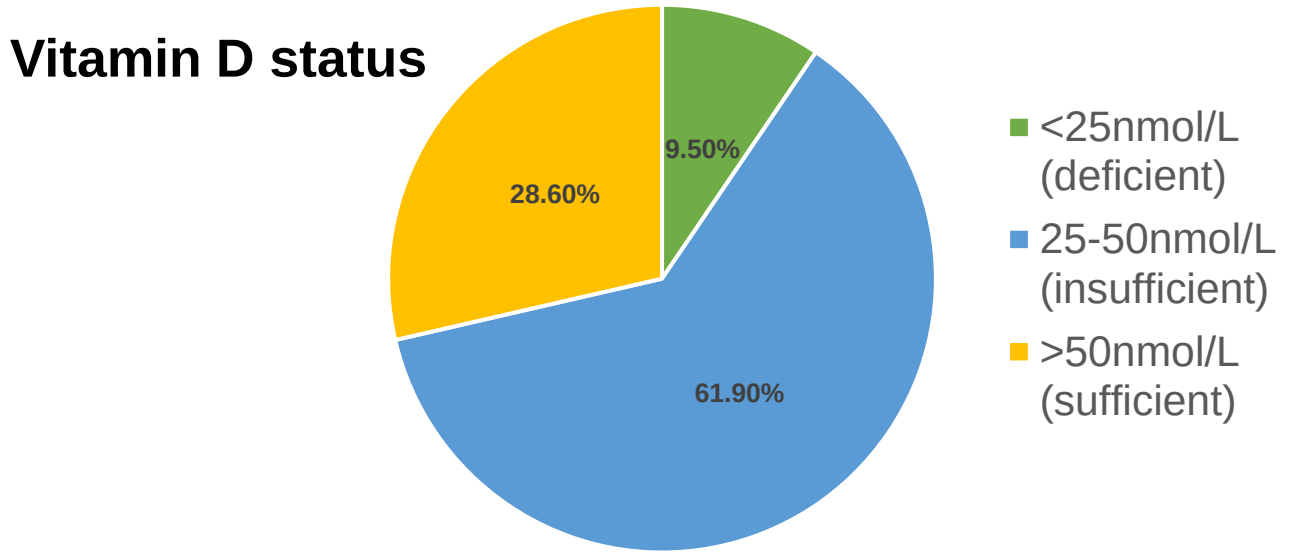
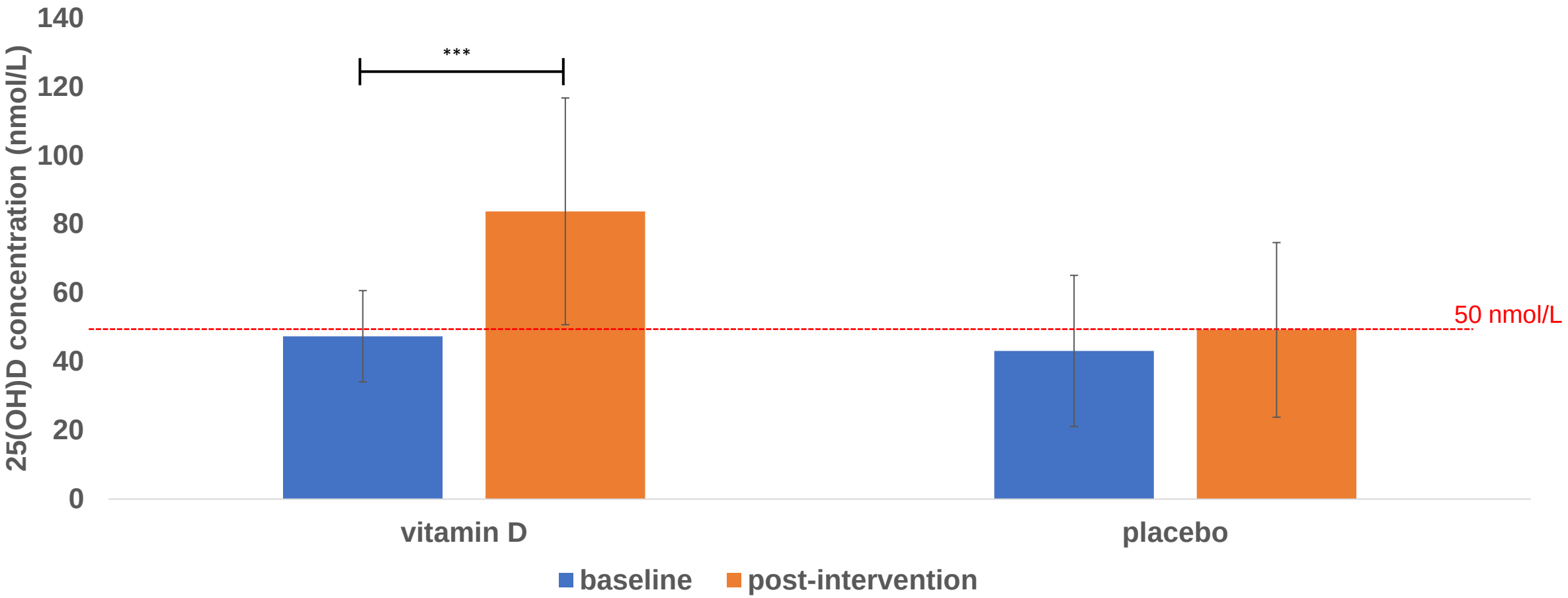
Eur J Nutr 2017;56(4):1577-1587

Baseline characteristics

Measure	Vitamin D (*n*=22)	Placebo (*n*=20)
Age, y	20 ± 2	20 ± 2
Sex, m:f	12:10	6:14
Height, cm	171.39±8.65	165.65±10.18
Weight, kg	70.52±11.49	61.92±10.69
BMI, kg/m^2	23.89±2.66	22.31±2.19
Vitamin D intake, μg/day	6.73 ±5.33	4.93 ± 2.47



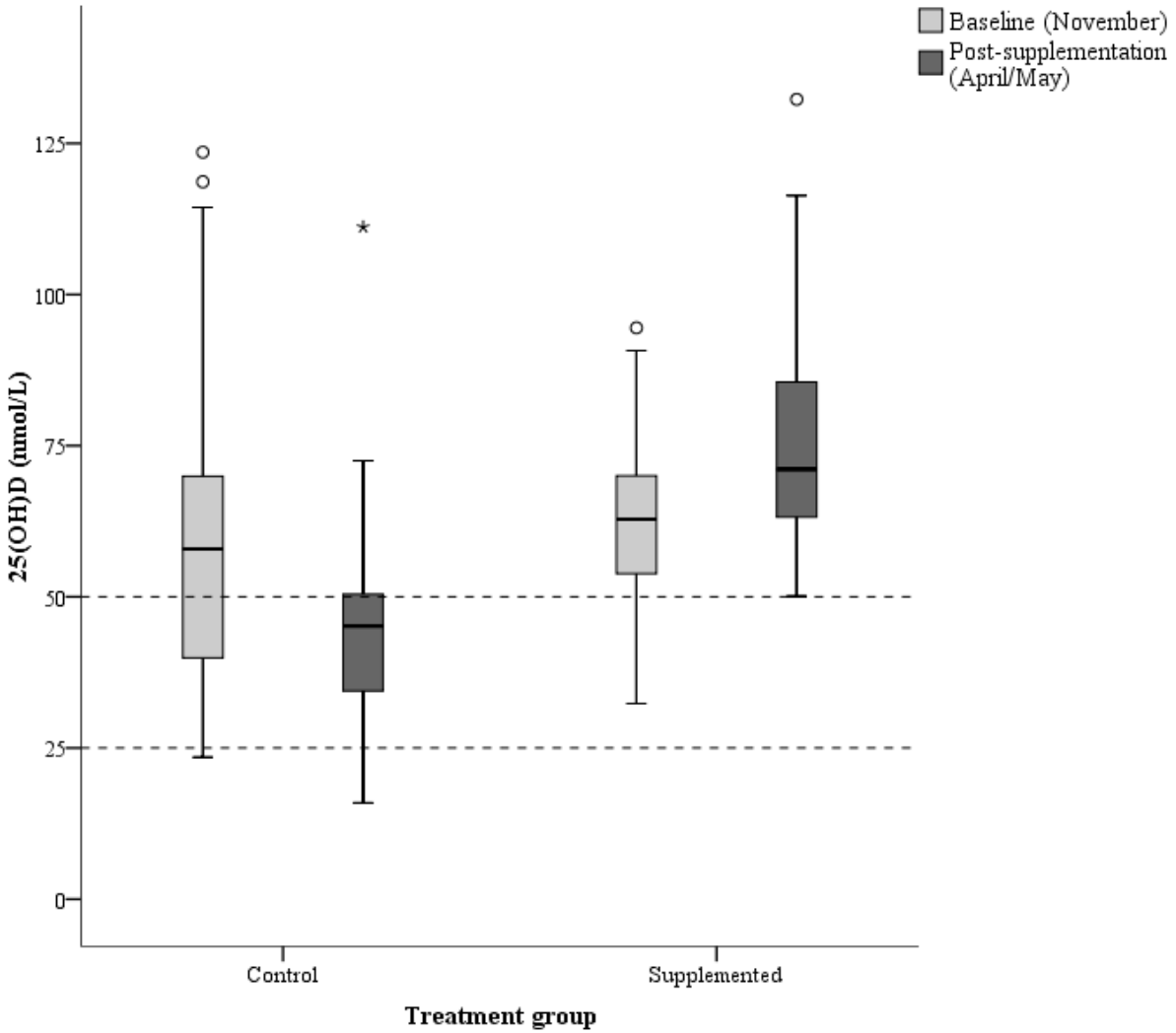
Effect of supplementation on vitamin D status in Gaelic footballers.



*** significant change over time between groups, ANOVA, p<0.001

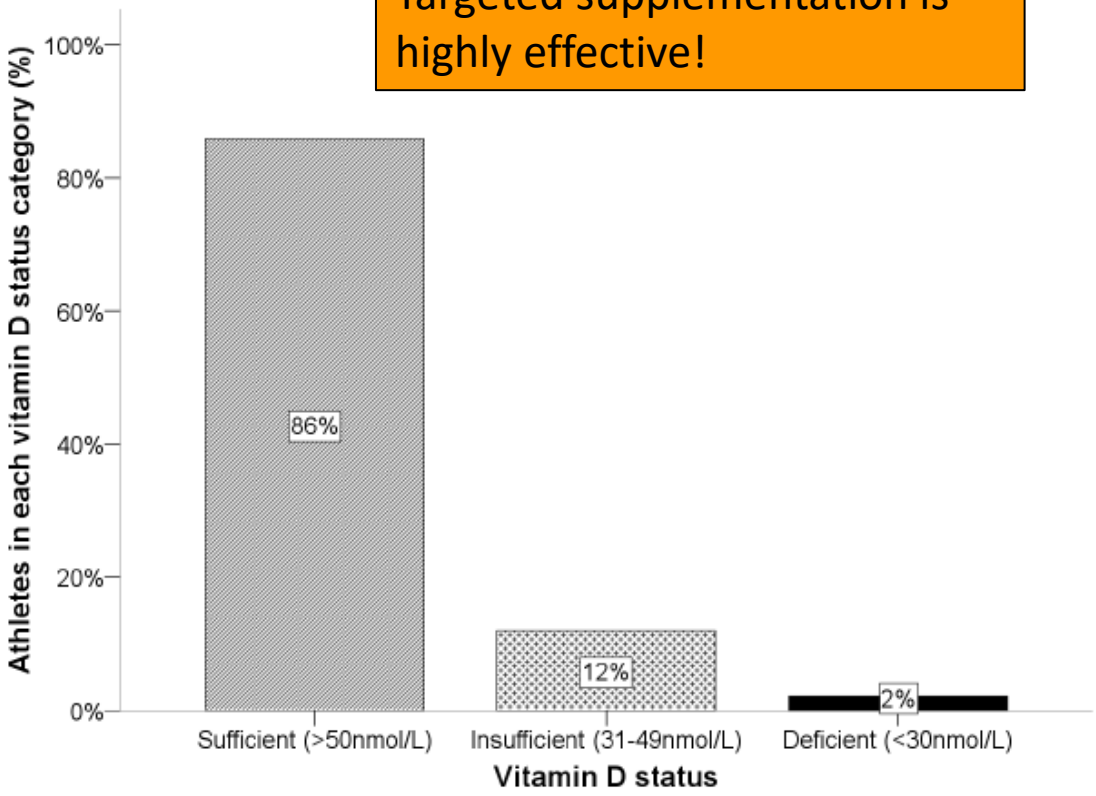
(Todd et al. 2017)

Effect of supplementation on vitamin D status in elite athletes.



Magee et al., 2013. Int J Sports Nutr Exerc Metab 23:441-448.

Targeted supplementation is highly effective!



Todd et al. 2016 Nutrients 8, 485.

Conclusions

- Nutritional knowledge is lacking in Gaelic/rugby players, especially in relation to supplements.
- Players are not meeting their dietary requirements for carbohydrate, fibre and vitamin D; implications for health and performance.
- Vitamin D status should be monitored where possible, and supplementation recommended accordingly (particularly important during winter months).
- Need for educational interventions to improve knowledge and subsequently dietary intake.

Future Work

PhD researcher: Chris McDonald

‘Enhancing dietary intakes in team sport athletes for optimal health and performance (the EDIT study).’

Supervisors: Dr Pamela Magee, Prof. Emeir McSorley, Dr Andrea McNeilly

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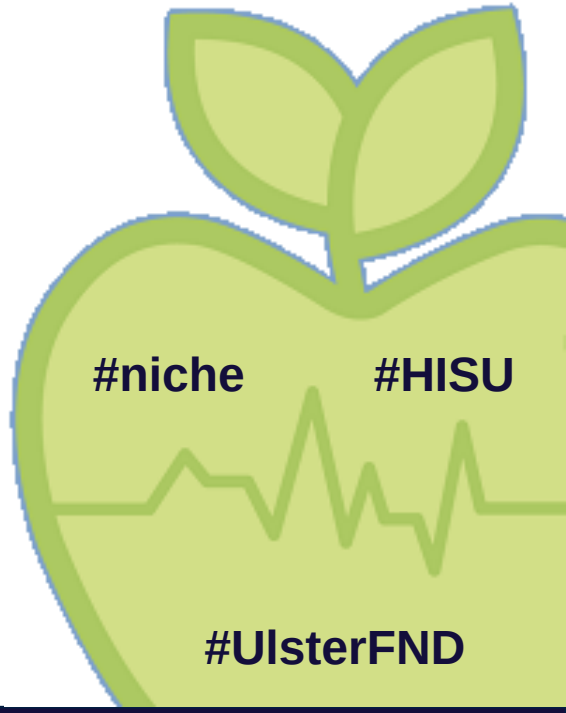
Players!



Thank you!