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Nutritionally priming the Elite Female Footballer



POSTER 1: Female Elite Football Hydration

POSTER 2: 'Topping up the tank' during competition

POSTER 3: Fuelling Pre-Competition

***An educational tool for Elite Athletes and their Support Coaching Staff**

HYDRATION

Female Elite Football

WHY

During Exercise the bodies number one cooling mechanism is evaporation, where the body produces sweat to thermoregulate. Sweating can affect the bodies electrolyte levels, notably sodium and Potassium (Shirreffs et al., 2006). If this process is not effectively regulated, the bodies ability to function becomes about as useful as a water slide minus the water! This is because human body weight is approximately 50-70% water. To ensure peak performance, athletes need to be aware of the risks associated with inadequate hydration and incorporate strategies to mitigate the effects associated with dehydration (Belski et al., 2020)



POSSIBLE IMPLICATIONS OF DEHYDRATION



Inconsistent Blood viscosity affecting transport of nutrients and oxygen to organs and musculature = detriment to performance



Muscle cramping and potential effects of heat related illness



Decreased cardiovascular function & motor function



Increased Heart Rate & Fatigue

Increased Perception of Effort

(Belski et al., 2020; Burke et al. 2021a)

NUTRITION INFORMATION		
Servings per package: 1 Serving Size: 600 mL		
Average Quantity	Per Serving	Per 100mL
Energy	618kJ 147.7Cal	103kJ 24.6Cal
Protein	0g	0g
Fat, total ~ saturated	0g	0g
Carbohydrate ~ sugars	35g	5.8g
Dietary Fibre	0g	0g
Sodium	174mg	29mg



(AIS Supplements Framework - Sports Drinks)

WHAT



HEAT



ALCOHOL



ALTITUDE



ILLNESS



DEHYDRATION ASSOCIATED RISK FACTORS

For each 1kg (BW) lost
replace with 1.5L of fluid
(deduct fluids & foods)
(UK Sports Institute)

Calculating Sweat Loss

Sweat Loss = Change (BW)g + Fluid Intake (ML) - Urine Loss (g) (Burke et al., 2021a)

INDIVIDUALISATION: (Shirreffs et al., 2006)

A (BW) variation of <2% is deemed acceptable Sweat Loss during Training & Competition. Individualisation factors critical to player wellness include; goals, the duration of the match, pre-game nutrition and physiological markers.

(Burke et al., 2021; Shirreffs et al., 2006)

WHEN

	SUGGESTED	CONSIDERATIONS
Water Daily	Approx. 2L	
Pre-Exercise	5–10 mL·kg ⁻¹ BW	Urine can inform osmolality
During Exercise	400–800 mL·h ⁻¹ Avoid deficit <2% BW	Pre-determined Sweat Rate Loss Calculations
Post Exercise	125–150% of fluid deficit	

(Belski et al., 2020)

Watermelons
are 92% water
& packed with
nutrients

FUN FACT



A paper by Maysa de Sousa suggests that football athletes are at high risk of Hypohydration. Of interest, approx. 49% of female footballers suffer hypohydration prior to training and competition.

Individualism is most important to managing Hydration. In summary, consuming water is a fundamental requirement daily for the athlete and hydration can be sourced in various foods (eg. watermelon; cucumber etc) as a hydration strategy.

The manufacturers of Powerade suggest consuming 250ml per 15 mins during 60 mins of strenuous exercise. There is cited benefit to the use of sports drinks as a hydration agent (eg. Replenish Sodium and Glycogen stores (CHO)

(Burke et al., 2021a)

FUN FACT

FIFA have endorsed
Powerade since 2010 and
are a sponsor of the USA
WOMEN'S Football Team



POWER
ADE



HOW

Well
Hydrated
urine is
not dark

FUN fact



TOPPING UP THE TANK

A nutritional guide for Elite Women Footballers during competition



WHY

Elite Football Athletes can cover between approx. 9-12 km+ per game and therefore require the use of aerobic energy systems (Baker & Heaney 2015). Intermittent bouts are a notable requirement in football and due to the intensity and duration of a match, fatigability can affect performance if CHO stores are depleted (Burke et al., 2021a). 60-70% of energy requirements are supplied by CHO during a match (Dasa et al., 2023). Hydration plays a critical role in peak performance outcomes for football athletes competing at all levels (de Sousa et al., 2022)



Restore Blood Glucose (CHO)
Restore Muscle Glycogen(CHO)

WHY?



Maintain Metabolic Pathways
Efficient Muscle Contractions
Reduce the onset of fatigue

(Bonnici., 2019)



Restore Electrolytes
(Sodium, Potassium)

WHY?



Sweat loss produced during exercise causes a hypotonic disrupted state, effective hydration maintains homeostasis

(Bonnici., 2019)

Approximate Energy Expenditure during a match is 1300-1600KJ (Collins et al., 2021)

FUN FACT

KNOW YOUR INDIVIDUALISED REQUIREMENTS AND ENSURE THESE ARE MET.

FUN FACT

Pretzels are given to Ironman athletes during competition due to their high sodium and potassium content

HOW

TRIED AND PROVEN IN TRAINING

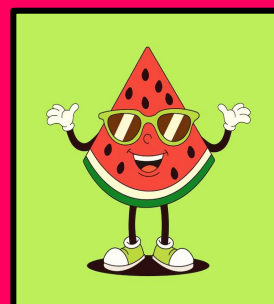
QUICK ABSORPTION

WHAT

Powerade (600ml) provides the athlete approx. 618kj, 35g CHO, 168mg of Sodium and 200mg of Potassium.

GU Espresso Love Gel
23g CHO, 60mg Sodium, 40mg Potassium, 40mg caffeine
(Burke & Hawley 2018)

EASILY DIGESTIBLE



ACCESSIBILITY

Pretzels provide a natural source of sodium and potassium and should be consumed with fluid (Shirreffs et al., 2006)

Fruits are filled with nutrients and some provide a valuable hydration alternative (eg. Watermelon)

CALCULATING SWEAT LOSS

Sweat Loss = Change (BW)g
+ Fluid Intake (ML) - Urine Loss (g) (Burke et al., 2021a)

FUN FACT

In extreme cases pickle juice is used to reduce muscle cramping (Burke 2021b)



Pre-Competition Fueling

A nutritional guide for Elite Women Footballers for pre-competition



The objective of an effective individualised nutrition strategy is to potentiate peak performance via central and peripheral Nervous Systems and delay the onset of fatigue (Burke et al., 2021; Shirreffs et al., 2006). This is achieved in competition by preparing, regulating the maintaining the body's blood glucose, muscle glycogen levels and via euhydration (Burke L.M 2021b).

During football competition, CHO account for 60-70% of energy expenditure (Dasa et al., 2023; FIFA 2016), thus targeted storage for this macronutrient should occur in the pre 24 hour cycle leading up to the event as a strategic priority. This type of periodised planning is critical during competition (Burke 2021b).



Pre match fueling should be individually strategic and structured. The loading patterns should be high in CHO, low in fats and low in fibre (De Sousa et al., 2022).

24 hours lead in: Maintain adequate CHO intake in line with recommendations and promote effective use of hydration strategies (Belski 2020)

3-4 Hours Prior: For an afternoon match the main pre-meal should follow a light breakfast, additionally aim to consume fluid approx. 5-7ml.kg BW 2-4hours prior to the match (Bonnici 2019)

Pre Match Snack: A smart choice here (25-30g CHO) can spare muscle & liver glycogen and promote euglycemia (Bonnici 2019)



An individualised dietary plan is designed to minimise key performance constraints with the implementation of key nutritional counter measures (Figure 1: Burke 2021b).

A food first approach should be prioritised in alignment with a well researched set of interventions.

Player wellness and collaboration should be upheld in the High Performance Program with the use of horizontal leadership. This should be In conjunction (in this example) with the Dietitian and associated stakeholders with a vested interest in working with athlete health and wellbeing (Goleman, D. (2017)



WHY

FUN FACT

Great sports people know; Failing to prepare is preparing to fail 'CHO Load'

THE EFFECTS OF WELL CONSTRUCTED FUELING PRIOR TO COMPETITION



A creative plan can increase PCr stores and a consistent strategy can prevent gut disturbances (Burke 2021b)



Pre-Event Fluid planning likely ensures euhydration and reduces the risks associated with hyponatremia (Shirreffs et al., 2006)



Pre-loading of CHO allows for glycogen storage affecting glycogen synthesis, this makes for very satisfied metabolic pathways (eg. provide sufficient energy required for muscle contractions)



Adequate CHO loading ensures euglycemia, meaning that blood glucose levels are prepared for action enabling sustained bouts of energy conversion (Bonnici et al., 2019)

24hr PRE-MATCH FUELLING

CHO 7-12g.kg BW.
Variation can be due to previous exercise

(Burke 2021b)

Know your dietary requirements & meet your habitual needs

In season (non match day)
CHO consumption should be approx. 5-7g kg-1 BW (Moss., 2020)



MATCH DAY MEAL OPTIONS

3-4 hours prior to kickoff
1-3g.kg BM per meal
(De Sousa et al., 2022)

(DeSousa et al., 2022)

No greater than **450-700k cal** per serve...Load up on the carbs!

Nitrate can enhance oxidation and muscle contractility (Burke 2021b)



Japanese rice and vegetables



2 x Buttermilk Pancakes + fruit



Chicken, vege & pasta soup

(AIS RECIPES)



Water and Beet Juice



PRE MATCH SNACK

(Bonnici 2019)

Choose a CHO rich pre match snack thats easily digestible (Bonnici et al 2019)



1 hour prior to match = 25-30g CHO

FUN FACT

Blood is approx. 80% WATER

15mns PRIOR TO KICKOFF

CHO liquids (300ml) with a shot of caffeine could be effective (Burke & Hawley 2018)



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