WOMEN'S HEALTH

Empowering Performance,
Strength & Wellness

Tirlán

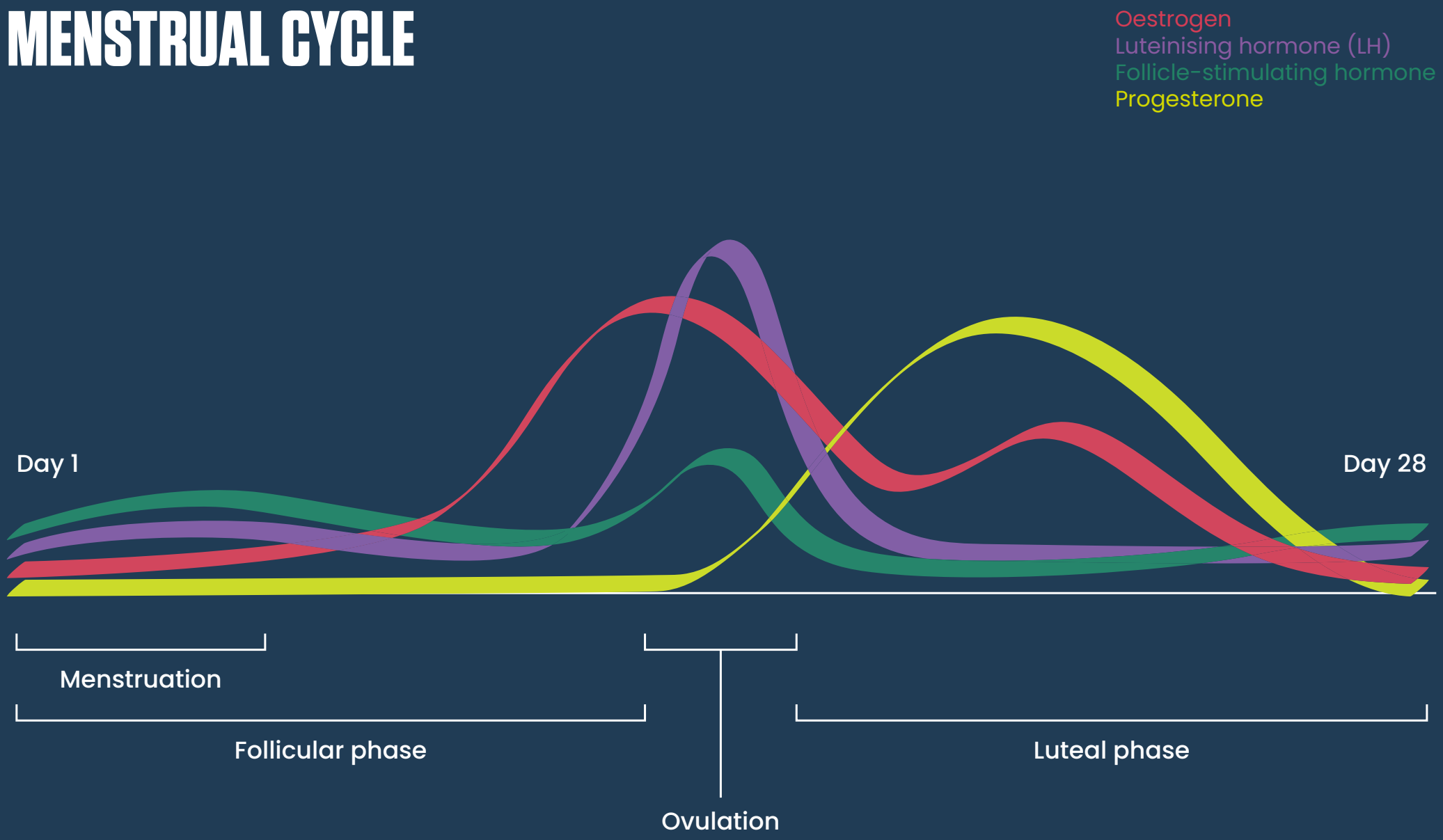
EXECUTIVE SUMMARY

WHY IS NUTRITIONAL FOCUS ESSENTIAL FOR FEMALE ATHLETES?

Optimal nutrition is key to any athletes performance and well-being. Historically, there has been a considerable lack of research on the exercise and nutritional requirements of female athletes. Women differ from men in terms of body composition, size, and hormones; thus, hormonal fluctuations in women can result in differences in nutrient metabolism and potentially impact performance. In a study of elite rugby players, nearly all women reported menstrual cycle symptoms that they perceived impacted negatively on their performance.[1]

Oestrogen is considered an anabolic hormone and linked with improved muscle strength and bone mineral density.[2] Women tend to metabolise more fat and less carbohydrates than men during exercise at the same intensity.[3] What's important to note is that these changes and their impact on performance are highly personalised to each woman. Women should therefore track their cycles to optimise nutritional and training strategies, enhance performance, and support overall well-being.

MENSTRUAL CYCLE



FOLLICULAR PHASE

EARLY FOLLICULAR PHASE

The early follicular phase is the initial stage of the menstrual cycle, beginning on the first day of menstruation and lasting between two and seven days. During this time, the body releases a hormone called follicle-stimulating hormone; which helps fluid-filled sacs in the ovaries called follicles start to grow; each follicle contains an immature egg. As the follicles grow, they produce oestrogen, a hormone that helps prepare body for ovulation. At the same time, the uterus sheds its lining from the previous cycle, which is why menstruation occurs. Both oestrogen and progesterone levels are at their lowest at this time.

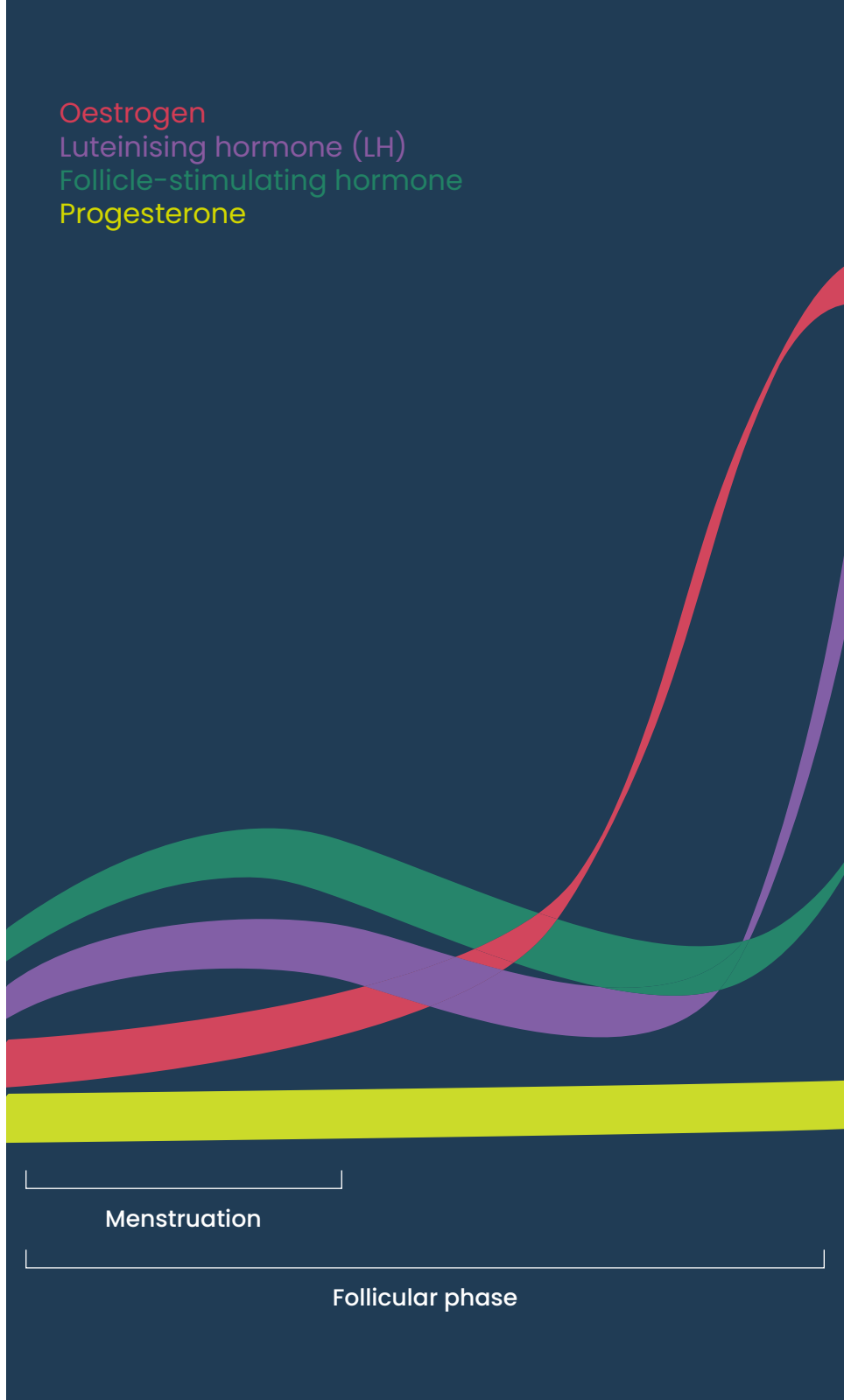
MID TO LATE FOLLICULAR PHASE

The mid-to-late follicular phase occurs after menstruation and prepares the body for ovulation. During this phase, one dominant follicle continues to grow while the others stop developing; this follicle produces increasing amounts of oestrogen, which thickens the uterine lining for ovulation. As oestrogen levels rise, they signal the brain to lower follicle-stimulating hormone and eventually trigger a surge of luteinising hormone. This surge causes ovulation, releasing a mature egg from the body.

CONSIDERATIONS IN THE FOLLICULAR PHASE

1. Athletes report reduced performance in the early follicular phase and late luteal phases compared to other phases across the menstrual cycle as well as menstrual symptoms, increased gastric discomfort and fatigue.[4] A study on the effects exercise performance across the menstrual cycle for athletes with regular cycles also reports reduced overall performance in the early follicular phase compared to all other phases of their cycle.[5]

2. The ability to store carbohydrates as glycogen could be reduced in the follicular phase.[6] Athletes should particularly focus on meeting energy and carbohydrate requirements during this time, especially when glycogen availability could limit training or competitive performance.



OVULATION

Ovulation is the process in the menstrual cycle when a mature egg is released from the ovary, typically occurring in the middle of the cycle. A surge in the luteinising hormone triggers the dominant follicle to release the egg, which travels towards the uterus. If fertilisation does not occur between 12 to 24 hours, the egg breaks down is absorbed by the body.

CONSIDERATIONS IN THE OVULATORY PHASE

1. Strength performance may be best in the late follicular and ovulatory phases.[3,7]

2. However, the increased oestrogen levels may affect ligament laxity, potentially raising the risk of joint injuries.[8]

LUTEAL PHASE

EARLY TO MID-LUTEAL PHASE

Following ovulation, this early to mid-luteal phase lasts about a week. During this time, progesterone levels rise significantly, accompanied by a secondary peak in oestrogen. These hormones help thicken the uterine lining, in preparation for potential pregnancy and support overall reproductive help.

LATE LUTEAL PHASE

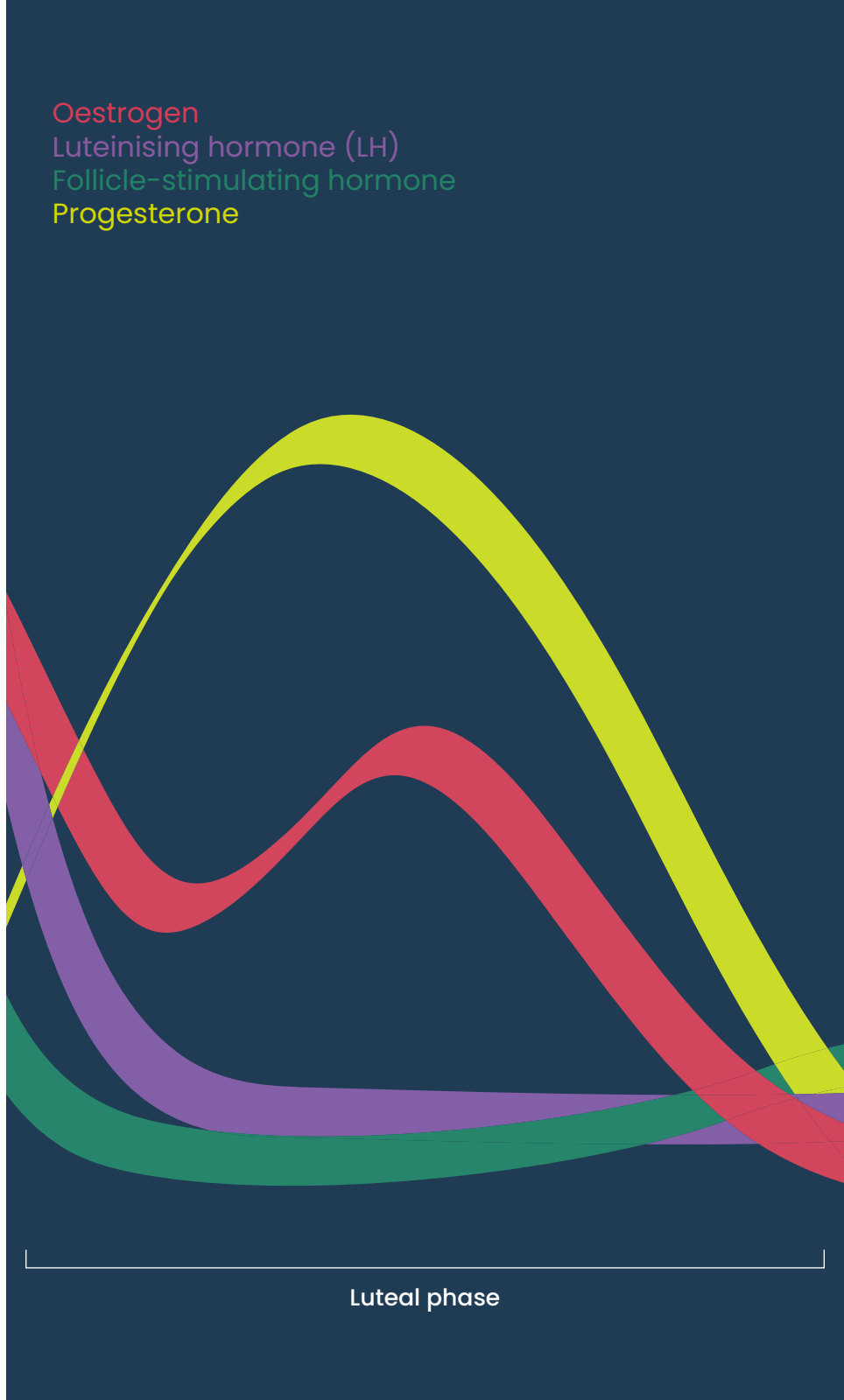
If pregnancy does not occur, the late luteal phase sees both oestrogen and progesterone levels decline sharply in preparation for menstruation.

CONSIDERATIONS IN THE LUTEAL PHASE

As hormone levels drop, women might experience premenstrual symptoms like fatigue, bloating, and fluctuations in mood. Women report lower performance in the late luteal phase.[3] To help manage these symptoms, maintaining energy and nutrient intake is fundamental to prevent fatigue and support recovery. Over time, increasing omega-3 intakes could help with managing PMS symptoms.[9]

1. Increases in progesterone also elevates core temperature in the luteal phase, but there appears to be minimal effect of the menstrual cycle on sweat rate or fluid balance.[2] These are likely to be more determined by workload, body size and environment.

2. During the luteal phase, female protein requirements may increase by approximately 12% due to the rise in progesterone levels.[5] Energy requirements could also increase in this phase.[2] Ensuring sufficient protein intake, especially from high-quality sources like **Promiko Whey Protein Isolate (WPI)**, can help support muscle repair and growth.



ARE FEMALE ATHLETES AT RISK OF UNDER-FUELLING?

The most important consideration is that female athletes meet their energy and nutrient requirements across all phases of their cycle. Low energy availability occurs when calorie intake doesn't meet the demands of training and daily activities. This can be intentional, when athletes restrict their calorie intake to maintain a specific weight or appearance; or unintentional, when female athletes inadvertently fail to consume enough calories or nutrients due to lack of knowledge, time, or access to proper nutrition.

Failing to consume enough calories and nutrients throughout a woman's menstrual cycle can hinder performance and use up energy reserves too rapidly and too often, leading to disruptions in their menstrual cycle and potential bone health issues.[5] Beyond the physical risks, which are often overlooked, inadequate nutrition can impair brain function, contribute to depression, and prevent optimal performance as a result of energy depletion, imbalanced hormones and the body's stress response.[10]

A study in Ireland found that up to 40% of female athletes were under-fuelling, highlighting the need for better awareness surrounding energy intake. Ideally, female athletes should consume 45 calories per kilogram of fat-free mass per day to support performance and overall health.[11]

PROTEIN: THE BUILDING BLOCK OF PERFORMANCE & RECOVERY

Protein plays a crucial role in muscle repair, recovery, and growth. Female athletes should aim to consume between 1.2 and 2.0 grams of protein per kilogram of body weight daily.[5] Whey protein isolate (WPI) is particularly effective for post-exercise recovery due to its fast absorption and being rich in leucine, an amino acid that helps build muscle.

During periods of calorie restriction, higher protein intake can help maintain lean muscle mass. Consuming protein before and during exercise supports muscle recovery and growth during both endurance and resistance training.[5] However, it's important to maintain a balanced protein intake while also meeting carbohydrate requirements, as carbohydrates are essential for providing the body with energy.

For women with regular menstrual cycles, protein needs are higher during the mid-luteal phase when progesterone levels peak. During this time, the body breaks down more protein. The International Society of Sports Nutrition recommends increasing protein intake by about 12% during this phase to meet these higher demands.[5]

CARBOHYDRATES: FUEL FOR TRAINING & RECOVERY

Carbohydrates are the primary energy source for athletes. Female athletes need to ensure adequate carbohydrate intake, especially during the follicular phase when glycogen storage capacity is reduced. Oats are an excellent carbohydrate source, providing a slow release of energy due to their low glycaemic index. For moderate activity, females should aim to consume between 7-10 grams of carbohydrates per kilogram of body weight daily; and up to 12 grams for endurance and high intensity sports.[12] All women should focus on rapid consumption of carbohydrates at 1.2g/ kg body weight 4-6 hours post exercise. Including protein at 4:1 (CHO:protein) may also help with recovery.[3]

HEALTHY FATS & MICRONUTRIENTS

In addition to focusing on sufficient protein and carbohydrate intake, healthy fats are essential for overall health and hormone production. Athlete's should get 20% of their energy from fat.[3] Some sources might include avocados, nuts, seeds, olive oil, and fatty fish. Low fat intake is associated with increased injury risk in female runners. Omega-3 fats in particular could help with managing inflammation and enhance muscle recovery.[13]

Calcium, vitamin D and iron are also particularly important for female athletes. Calcium and vitamin D support bone health, and are particularly important for women with low energy availability, as they are at increased risk of fracture. Iron is crucial for oxygen transport in the blood and in energy metabolism. Often women with heavy menstrual bleeding might need to pay extra attention to their iron intake to prevent deficiency.[3] Moreover, staying **well-hydrated** is essential for performance and recovery. Fluid needs can vary based on activity levels, climate, and individual sweat rates and some studies largely indicate that increased water consumption during menstruation can ease cycle symptoms, such as bleeding duration and pain intensity.[14]

OPTIMISING PERFORMANCE WITH TARGETED NUTRITION

Female athletes can benefit from science-backed nutrition strategies that align with their menstrual cycle. Plant based ingredients like Oat-Standing™ Oats offer practical, high-quality solutions to manufacturers creating products to meet meet protein and carbohydrate needs throughout training benefits and competition.

#Promiko
Cross Flow Microfiltration

solmiko
ADVANCED MILK PROTEINS

KEY BENEFITS

of Promiko WPI and Solmiko MPI for Female Athletes

SUPPORTS MUSCLE GROWTH AND REPAIR

High quality proteins such as Promiko WPI and Solmiko MPI can help in the rapid repair of muscle tissues post-exercise. They promote muscle growth and enhance overall muscle health.

QUICK ABSORPTION

WPI is quickly absorbed by the body, making it ideal for immediate post-exercise consumption. This helps kickstart the recovery process and ensures that muscles receive the necessary nutrients to repair and grow.

MAINTAINS LEAN MUSCLE MASS

Increased protein intake alongside resistance training can promote increases in lean body mass.[15] This is particularly important during calorie-deficit phases to prevent muscle loss and support overall strength.

SUPPORTS IMMUNE FUNCTION

WPI contains immunoglobulins and lactoferrin, which support immune function.

NUTRITIONAL DENSITY

MPI contains significant levels of calcium, a nutrient of concern for the female athlete as well as B-vitamins.

CONVENIENT AND EFFECTIVE

Promiko WPI supplements are easy to consume and can be incorporated into various meals and snacks, making it convenient for female athletes to meet their protein needs, even with busy training schedules.

OPTIMISING PERFORMANCE WITH TARGETED NUTRITION

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OAT-STANDING™

KEY BENEFITS

of Oat-Standing™ Oat Ingredients for Female Athletes

RICH IN FIBRE AND PROTEIN

Oats can be consumed either as a nutritious alternative to dairy or alongside it, as they are rich in both fibre and protein. The high fibre content helps maintain digestive health and provides sustained energy, which is crucial for female athletes during training and competition throughout the menstrual cycle.

SUSTAINED ENERGY RELEASE

The complex carbohydrates in oats provide a slow release of energy, helping female athletes maintain their energy levels throughout prolonged training sessions and competitions.

DIGESTIVE HEALTH

The soluble fibre, and low-glycaemic index, found in oats helps regulate blood sugar levels and improve satiety.

ANTI-INFLAMMATORY PROPERTIES

Avenanthramides (AVA) in oats have antioxidant and anti-inflammatory effects, aiding in recovery and reducing muscle soreness after intense workouts.

THE IMPACT OF PHYSICAL ACTIVITY ON MENTAL WELL-BEING

A review of 1,158 studies revealed that 89% identified a statistically significant positive link between physical activity, including exercise and mental health. The three types of exercise most strongly associated with mental health benefits were general physical activity, cardiovascular or aerobic exercise, and mindfulness activities.[16]

Additionally, a 2024 global study on the gender exercise gap reaffirmed the strong connection between women's mental well-being and physical activity levels. Women who exercise regularly reported feeling 52% happier, 50% more energised, 48% more confident, 67% less stressed, and 80% less frustrated.[17]

52% HAPPIER

50% MORE ENERGISED

48% MORE CONFIDENT

67% LESS STRESSED

80% LESS FRUSTRATED

ADDRESSING THE GENDER GAP IN FEMALE STUDIES

Despite increasing female participation in sports and greater visibility in the media, a significant gap remains in research dedicated to female athletes. A 2022 study found that while 63% of sports nutrition publications included both male and female subjects, only 6% focused exclusively on female athletes, whereas 31% were conducted solely on men. Applying male-centric data to female athletes overlooks crucial hormonal differences that affect temperature regulation, metabolism, and overall performance.[18]

The lack of female-specific research has real-world consequences, as training protocols, nutritional guidelines, and recovery strategies are often generalised from male-centric studies. Additionally, the sports industry's investment patterns reflect this gender disparity. Brands allocate just 9% of their total sports media investment to women's sports, limiting exposure, funding, and innovation in female-focused nutrition products.[19] This underinvestment further perpetuates gaps in knowledge, product development, and athlete support systems. An encouraging 83% of brands planned to increase their media investment in women's sports in 2024. As investment and research in women's sports continue to grow, this remains a crucial space for industry leaders to watch.

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