



AFC Leyton
Women & Girls

Sporting Performance:
**Understanding the Impact of the
Menstrual Cycle in Female Football**



About this document

This document has been produced to start to explore female footballers' experiences and perceptions of the menstrual cycle in relation to its impact on sporting performance, as well as to give coaches a wider of understanding of how this can impact their training sessions and match day performance.

None of the data, findings or assumptions contained in this document were produced by AFC Leyton. Rather this document pulls together research and information from various sources that is already available for public consumption.

This document does not seek to be a definitive resource on ACL injuries and hormones or provide medical advice.

For all medical concerns you should visit your G.P in the first instance.



In general, there has been very little in the way of research in looking at the female biology compared to males in football. This means that females by and large train and compete in the same way as men do, with little consideration to differences.

We know that relationships exist between the menstrual cycle, associated hormonal fluctuations and health, well-being and sporting performance and that within the general population, the menstrual cycle and its related physical and psychological symptoms have a negative effect on daily life and activities including absenteeism from school or work.

From a sporting context, Martin et al reported that 77% of elite athletes not using hormonal contraception had negative side-effects during their menstrual cycle; including pain (abdominal/back), cramps (abdominal) and headaches/migraine. Bruinvels et al identified that half of elite British female runners and rowers felt that their menstrual cycle had in some way impacted on their training and sporting performances.

Females do therefore have fluctuating training and dietary needs depending where they are in their monthly cycle.

For example, When accounting for football exposure, women do have a different injury risk profile than men. Women have a higher risk of serious knee injury (such as ACL rupture) = which is at least double in women than in men. Women also have a higher risk of concussion and ankle injuries than men.
(However men do have a greater risk of hamstring, hip and groin injuries when compared to women.)

Overall, much more information and research is needed and greater inform training programmes and techniques used on women and girls training sessions.

"Women have a monthly cycle of hormones, which have **powerful effects** on our bodily system, emotions and mood,"

*Dr Emma Ross, co-head of physiology
English Institute of Sport (EIS)*



Changes & Symptoms

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Puberty 9+



When does puberty occur in females?

- When girls get to around the age of 9 they begin a four-year process called puberty. This involves an increase in the primary hormones, oestrogen and progesterone. This is 1-3 years earlier than boys.
- Puberty is seen as a confusing time of significant physical, emotional and social change for girls, which they often feel unprepared to deal with due to a lack of education.
- Girls will also start to menstruate during puberty and may experience a number of physical and emotional changes as a result. It is important to appreciate that it can take a while for girls to adjust to these.
- When girls first start to menstruate, their cycle is more likely to be irregular and may be longer or shorter than the typical 28-day cycle (\pm 5 days). This is very common and is just a process that happens as their hormones settle into a regular pattern. This makes it especially difficult to predict when their period might start and to be adequately prepared.
- Support is also needed to de-stigmatise periods and arm players with the knowledge and tools to stay active during puberty, to prevent them from falling into inactive habits that can follow them into later life.



Symptoms

Let's now take a look at some of the effects of menstrual cycle, in both physical and psychological changes.

Physical Symptoms

- Studies show that almost all athletes (93%) reported having negative symptoms (physical or psychological) associated with their menstrual cycle.
- A range of symptoms were highlighted, most notably in the few days before and at the onset of menses. The most prevalent physical symptoms included stomach cramps/abdominal pain (80% of athletes) reduced energy levels, flooding and general discomfort.

Psychological Symptoms

- Psychological symptoms manifested as worry, distraction, negative mood states, feeling tearful and emotional, reduced motivation and feelings of agitation.
- In contrast to the general population, relatively low absenteeism was reported during training. This may be due to athletes' internal and external pressures to perform.

These pressures may result in competitive athletes being more likely to endure training/competition despite experiencing symptoms.

[sources: [1], [2], [3], [9], [11], [12], [13], [14], [15], [16], [17]]

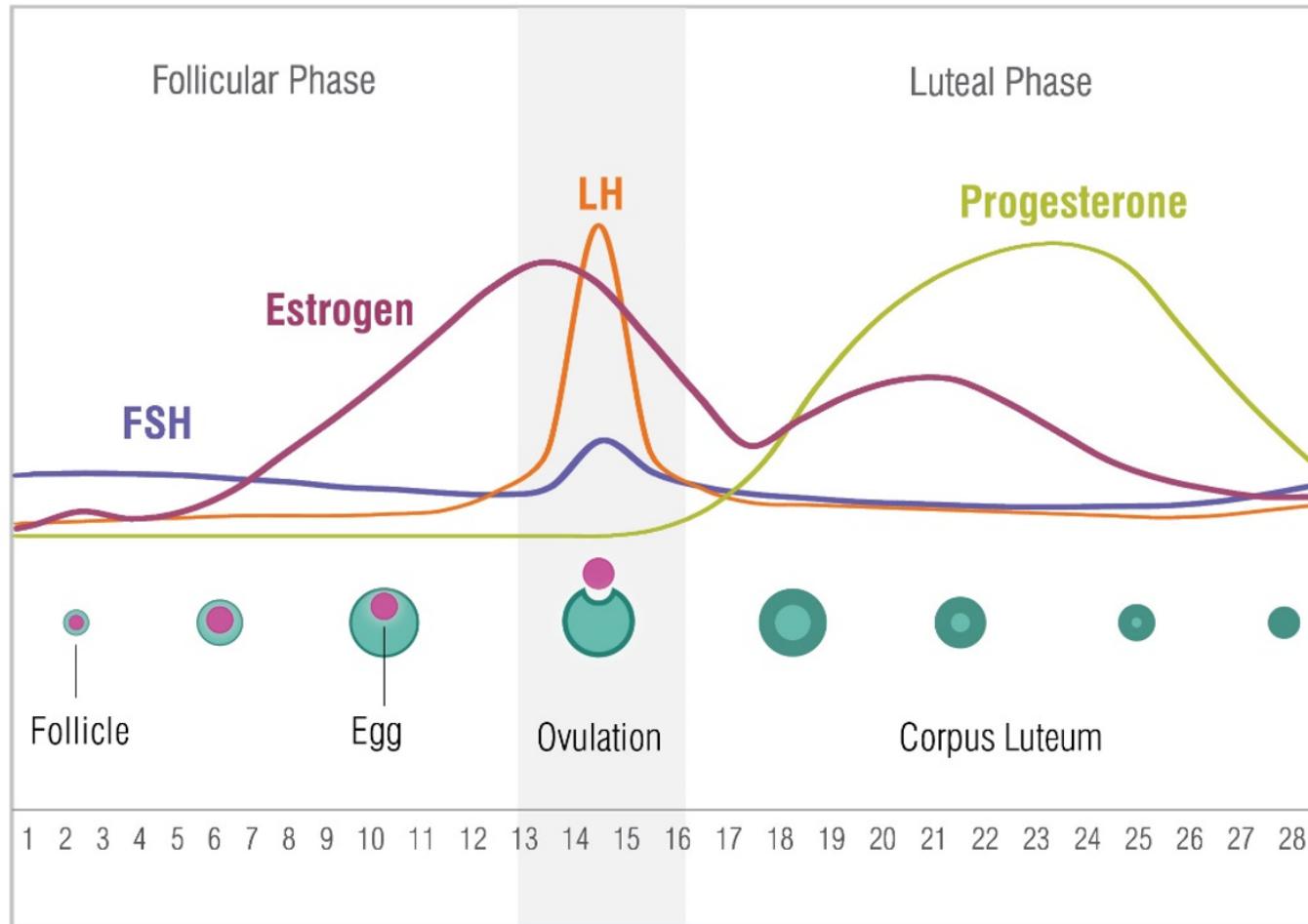


Tracking the Cycle

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Typical monthly cycle



This illustration is an example of a 28-day-cycle. Hormonal changes and day of ovulation vary with cycle lengths.



Tracking the Cycle & Reducing Injuries

Whilst both males and females can be injured at any time, since the upsurge in female football, there has been an increase in ACL injuries in female players. This was was double than male footballers. This has led to a growing area of interest is the impact of menstrual cycle and hormones on the knee leading to anterior cruciate ligament injuries.

- Several research studies have found that the first half of the cycle and particularly the build-up to ovulation is the key risk window to injury. The Herzberg 2017 study of nearly 70 thousand female participants, is just one significant piece of research out of many that has directly linked hormones to injury – finding that females were at a significantly higher risk of ACL tear before ovulation, during their follicular phase.

NB: Consideration needs to be given to being proactive around warming up properly or recovering properly, at certain times.

- Women on the combined pill appear to be less likely to tear the AC ligament in their knee, research suggests.

NB: Although such injuries to the anterior cruciate ligament in the knee are common, particularly in people taking part in sport, research found that reconstruction surgeries to the ACL were more common in those without a prescription for the pill. When the team looked closer, they found this was primarily driven by differences in injury rates among women aged 15 to 19

- Players can use a calendar, note book or an app. There is an app which has garnered much publicity recently called Fit Woman. This is free for female athletes to use to track their cycle and prepare better. <https://www.fitwoman.com/>. Coaches are able to have their team on this app, to remained informed about the players performance throughout the calendar month.

Other considerations

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■ Hypothalamic Amenorrhea

For some athletic females their menstrual cycle stops altogether. This is called hypothalamic amenorrhea.

Normally hormones are produced in the brain which then cascade down to signal hormones that are produced in the ovary. When hypothalamic amenorrhea occurs those hormones are not produced.

It is unclear what the trigger for this is. Studies have looked at the body's fat content, weight, cortisol levels, and the intensity of the workouts.

Hypothalamic amenorrhea can be dangerous for athletes aged under 30 as it leaves the body without oestrogen, which makes bones thinner and this is the period when the body typically builds peak bone mass.

The second issue of low oestrogen for all ages is a higher cardiovascular risk, as oestrogen is needed to protect the heart.

Coaching considerations (girls aged 9+ to adults)



- Coaches must have an understanding that:
 - Players attitudes to sports start to change as puberty hits. There becomes a perception of 'having to be good' at sport and playing sport for fun appears less acceptable. Alongside this negative body issues arise. "Looking good" becomes increasingly important and becoming 'overly sporty' can lead to negative stereotyping.
 - There is a higher risk of injury to players at certain times of the month. Without menstrual tracking in place, coaches must be proactive around ensuring all players are correctly warming up and recovering properly after exercise.
 - There is a noticeable dip in performance in the few days before and during menstruation. Coaches need to recognise that female players may be negatively affected at certain points in the menstrual cycle and not misinterpret this as the player being inconsistent. Especially as statistics show that female athletes are more likely to train and compete when suffering from negative symptoms due to internal pressures to do so.
 - A change in emotional state in days before and during menstruation, including agitation and lower motivation. Coaches need to recognise patterns in mood and motivation.

A Monthly View – Symptoms/Performance



■ Days 1 to 5:

- Symptoms Reaction times down, higher risk of soft tissue injuries.
- Training Stretching and yoga to help muscles, particularly in lower back; work on reaction times and possibly less high-level physical work.
- Nutrition Anti-inflammatory foods such as fish

■ Days 5 to 14:

- Symptoms Athletes often feel good in this phase but there is a higher risk of soft tissue injuries.
- Training Avoid drills involving sharp changes in direction which could damage knees and ankles.
- Nutrition Healthy balanced diet supporting training.

■ Days 14 to 25:

- Symptoms Food cravings, weight fluctuations, mood swings.
- Training Avoid salt and sugar which can cause inflammation; coaches might adapt how to talk to players given mood can be affected.
- Nutrition Protein to help facilitate recovery and complex carbohydrates to manage cravings.

■ Days 25 to 28:

- Symptoms Mood swings, poor reaction times and co-ordination levels, muscle pain, delayed recovery times.
- Training Hand-eye co-ordination and reaction drills; yoga; coaches might adapt how to talk to players given their mood can be affected.
- Nutrition Foods high in iron such as red meat, spinach and almonds



A Players View

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Overview for Players

Understanding your own body is the first step in fighting negative symptoms at certain times of the month.



- Good sleep is always important. Sleep disturbances are common just before menstruation, so emphasis should be on a good sleep routine.

The National Sleep Foundation Recommends:

- Children aged 6 to 13 years between 9 to 11 hours of sleep per night
- Teenagers aged 14 to 17 years between 8 to 10 hours of sleep per night
- Younger adults aged 18 to 25 years between 7 to 9 hours of sleep per night (this currently remains the same sleep duration up until the age of 64 years)
- Focus on a healthy, balanced diet. Foods high in sugar and saturated fat can worsen negative symptoms. Focus on fruit, vegetables and fibre.
- Eating foods high in iron such as red meat, spinach and almonds is important during menstruation to make up for iron losses from menstrual blood loss.
- Take control by tracking the cycle. You can use a calendar, note book or an app.

This app is free for female athletes to use to track their cycle and prepare better.

<https://www.fitwoman.com/>

- Be aware of risk to injuries: Whilst injury can occur to males or females at any time, research shows that during days 1 to 14 of your monthly cycle, you are higher risk to injury – esp ACL (knee injuries). Warm up and cool down properly.

Nutrition Guide for Players

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- How tired you are depends not only on your fitness level but also on what foods and fluid you have consumed. Players who eat a good diet have can run longer, sprint more, are less likely to get injured, keep their concentration for longer and are more accurate with their passing and crossing.
- The main components of nutrition are carbohydrates, fats and proteins, As well as vitamins, minerals, fibre and water for hydration purposes. The food and drink that we consume contain a variety of these nutrients so it is essential we find the right balance of these in order to optimise our performance. Basically eating the right things so the girls perform to the best of their abilities!
- How you perform during a match and training will depend on what you eat/drink BEFORE, DURING and AFTER each game/session. By eating and drinking the right foods and fluids your performance and the teams performance will improve.
- Carbohydrate and fluid intake should be the main consideration for football players, since glycogen (stored carbohydrate in the muscles) depletion and dehydration are 2 major causes of fatigue during football training and matches. Some of our girls will be making the jump from 7 to 9-a-side and 9-a-side to 11-a-side. This means the pitch size will increase as well as the duration of the match. This further emphasises the point of good nutrition and hydration.
- 1g of carbs releases about 4kcal of energy. Carbohydrates are our main source of energy during sport, so are really important the night before and the morning before our matches. Examples of this would be: Rice, bread, pasta, potatoes, cereals, fruit
- We recommend you eat breakfast 2 hours before KO. This will give the body enough time to digest the food properly. This sometimes this may not possible due to 10am / 9:30am KO's away but we do encourage to wake up that little bit earlier to do so.

Nutrition – Examples for Breakfast (match day)

Below are some examples of what could be consumed 2 hours before a match:



- **Excellent choices:**

- Toast and jam
- Baked beans
- Cereal and semi/
skimmed milk
- Fruit
- Fruit juice

- **OK choices:**

- Lean grilled ham
- Toasted muffins
- Bagels
- Boiled, poached,
scrambled eggs
- Crumpets

- **Bad choices:**

- Fried foods
 - Sausages,
bacon,
fried eggs,
hash browns
- Sweets, chocolates
- Fizzy drinks

A surprising find is that athletes have a prevalence of vitamin D insufficiency, despite the fact they can spend a lot of time outside training. This insufficiency is due to the expression of vitamin D receptors in muscles causing a decrease in circulating vitamin D due to high muscle activity.

A few studies showed that vitamin D supplementation increased musculoskeletal performance especially with regard to vertical jump height, as well as hand strength, aerobic power and capacity, and sprinting ability. Vitamin D also plays a big role in muscle regeneration following injury.

Nutrition examples – by cycle



■ Day 1 to 14

- Fruit; strawberries, raspberries, blackberries. (Contain antioxidants)
- Fish; salmon, tuna (great sources of protein and contain EPA and DHA which are types of omega-3 fatty acids)
- Avocados; superfood. Potassium, magnesium and fibre
- Veg; such as broccoli, peppers, mushrooms, tomatoes.
- Dark chocolate; another superfood.

■ Day 14 to 28

- Fruit; all including strawberries, raspberries, blackberries. (Contain antioxidants)
- Meat: Steak, lean minced beef, chicken, turkey, ham
- Fish: Salmon, lobster, mackerel, cod, prawns scallops, tuna, haddock etc
- Veg: such as soy, broccoli, peppers, mushrooms, tomatoes, beans & legumes.
- - dark chocolate; another superfood.

■ Try to Avoid

- Sugar sweetened food
- Refined carbohydrates (bread and tortillas containing white flour, waffles and pastries)
- fast foods; chips, fried chicken etc.
- - processed meats; bacon, hot dogs. etc

Fluid intake:
- PLENTY of water.
- green tea also; antioxidant properties

Females use carbohydrates more efficiently in the follicular phase (days 1 to 14) and are better at using fats and amino acids in the luteal phase (days 15 to 28)



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