

Protected food, drink or agricultural product name

Product specification for 'Welsh Leeks'

A protected geographical indication (PGI)

Responsible country: Great Britain

GB number: F0100

This document sets out the elements of the product specification for information purposes.

Competent authority

Name: G.I. Team, Department for the Environment, Food and Rural Affairs

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Applicant group

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Composition: Producers/processors /Other

Type of product (as in Annex XI Implementing Regulation 668/2014)

Class 1.6 – Fruit, vegetables and cereals fresh/processed

1. Product name(s)

‘Welsh Leeks’

2. Description

‘Welsh Leeks’ are leeks (from either seeds and transplants) which are grown on and harvested in Wales.

The seeds and transplants are brought in from certified seed companies and raised as transplants in accredited nurseries, who will provide each transplant with the required plant passport.

Leeks are a member of the vegetable allium family *Allium. ampeloprasum* with the edible part of the plant being the bundle of leaf sheaths. ‘Welsh Leeks’ are a product of several hybrid varieties, rather than one specific variety. The hybrid varieties used to produce ‘Welsh Leeks’ are those most suited to Welsh growing conditions.

‘Welsh Leeks’ have distinct characteristics and clear “visual differences” compared to leeks grown elsewhere. The key feature of ‘Welsh Leeks’ is their predominant long distinctive dark green flag which comprises over 40% of the overall length of the leek. The remaining stem is a light fluorescent green that becomes white only within the last 10 – 20mm when in close proximity to the root.

These “clear differences” of Welsh Leeks (compared to other leeks) were highlighted by independent sensory analysis carried out by Food Industry Centre Cardiff Metropolitan University Zero2Five and are recognised by both retailers, manufacturers and consumers.

Physical characteristics

	Range -
Total Length	280 – 350mm
Circumference of shank	38 - 42mm

Flag length	140 - 175mm
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A summary of the organoleptic characteristics – as identified by an independent sensory analysis panel is provided in the table below

Organoleptic characteristics

‘Welsh Leeks’ - Raw

Type	Characteristics	Description
Visual		
	Colour	“Predominant and long intense dark green flag with a lighter green coloured stem that becomes white towards the root (10 – 20mm). The leek has a smaller proportion of stem. The green on the stem is almost fluorescent in colour (distinctive point of difference).”
	Internal characteristics of stem when sliced (after removing flag and 10-20mm towards the root) Green throughout not white as others	“The sliced product is predominantly green with lighter shade of green toward the core of the stem. Good sliced characteristic, vibrant green.”
	Overall length	280 – 350 mm
	Flag length	140 -175mm
	Circumference	38 - 42mm
Aroma		“Fresh and mild”
Flavour		“Green stem peppery White stem sweeter than green stem”
Texture		“Good texture, crunchiest with a resistance to bite”

‘Welsh Leeks’ sliced and cooked (steamed)

Visual		
	Colour	The slices remain vibrant green in colour (almost fluorescent)” – when cooked
	Internal characteristics of stem when sliced (after removing flag and 1-	Good sliced characteristic, the leek slices well and retains

	2cms of stem towards the root)	their shape, structure and colour after cooking and need needed more cooking time to be (another 5 minutes) to be fully cooked” (compared to other samples).
Aroma		“Earthy, sweet buttery aroma”.
Flavour		Balanced strong onion/pepper flavour. Flavour retained on steaming. The green slices have a stronger flavour. Strongest, freshest flavour of the samples - compared to non- Welsh Leeks.
Texture		Crunchy, fibrous, strong texture. The green flag is more fibrous and crunchier (not squeaky).

‘Welsh Leeks’ are typically sold fresh within 24-72 hours; however, cold storage is permissible for short periods (a maximum of 4 weeks) to balance customer requirements using a high humidity cold store. ‘Welsh Leeks’ are then packed in Wales according to customer requirements and sold fresh either loose or ‘bunched boxed’ to wholesalers and to both independent and major retailers.

The qualities of ‘Welsh Leeks’ are preferred and sought after particularly by Welsh consumers, and major Welsh retailers when purchasing ‘Welsh Leeks’, will adjust their retail specifications to reflect these preferences.

The Welsh consumer’s preference for ‘Welsh Leeks’ size, diameter and abundance of green flag, makes them the chosen leek to be used as a key ingredient in iconic Welsh dishes such as Cawl (Soup) and in “pork and leek” sausages.

3. Geographical area

Wales

4. Proof of origin

‘Welsh Leeks’ maintain full traceability from their source to their arrival on farm. Traceability is then maintained throughout the growing, harvesting and sale of ‘Welsh Leeks’ to ensure full traceability from ‘field to fork’

From seed / plant;

‘Welsh Leeks’ are grown on from seed and / or transplants. The seed is brought in from certified seed companies and transplants are raised in accredited nurseries. These nurseries will provide each plant with the required passport.

All 'Welsh Leeks' are then grown on in Wales – this is recorded by the individual field OS Grid Reference.

On farm;

Immediately post-harvest, before the 'Welsh Leeks' leave the farm, each batch of 'Welsh Leeks', is allocated a unique number which makes reference to the date and field of harvest and the name and address of the Welsh farm from where it came. All information is recorded to ensure complete traceability for the customer / consumer.

Post farm packaging and distribution;

'Welsh Leeks' are sold to major supermarkets and buyers. Welsh Leeks are packed in Wales and sold either loose or in packs of various weights according to customer requirements

Post farm assurance including traceability is in line with British Retail Consortium Global Standard for Food Safety or equivalent. This system is required to identify and trace product lots throughout all stages of processing and distribution to market. The system ensures that produce supplied to customers are adequately labelled or identified to facilitate traceability. The system used is capable of linking raw material lot codes through to finished product codes. This enables the finished product to be identified should the recall of a particular batch need to be instigated. The traceability system covers primary packaging (in direct contact with food), other relevant packaging materials such as printed outer packaging, and processing aids. The system provides traceability "forwards" and "backwards" in both directions and the complete traceability system is independently audited at least annually.

5. Method of production

'Welsh Leeks' have numerous phases in their production cycle, starting from land rotation and through to harvesting.

Rotation

All 'Welsh Leeks' are part of a rotation whereby grassland grazed by stock must constitute between 30% and 90% of the rotation. This provides natural fertility and organic matter and contrasts to the main leek growing areas including the east coast of England where leeks are grown as part of a purely arable stockless system.

Choice of variety

Factors influencing the choice of variety used for 'Welsh Leeks' are those varieties best suited to Welsh growing conditions, seasonality (with varieties having different sowing and harvesting dates) and yield. As the acreage of leeks grown in Wales is relatively small, the risk and occurrence of pests and disease is lower so varietal choice due to pest and disease resistance is not normally a key factor.

The following varieties are those typically used to grow 'Welsh Leeks', but this list is not an exhaustive list.

- Shafton
- Krypton
- Belton
- Chiefton
- Pluston
- Laston
- Houston
- Linkton

Seed bed preparation

A well-prepared seedbed and final planting area to create a fine tilth, are required to grow 'Welsh Leeks' – preparation of a fine tilth encourages and optimises root development.

Sowing/transplanting

'Welsh Leeks' can either be sown by seed directly into the field or the seed is started in a seed bed and transplanted out in early to midspring, as soon as the soil is workable and has warmed up. Transplants can be categorised into "mini" and "large". "Mini" transplants are typically ¼ the size of the "large" transplants and attached together by tape, which speeds up the planting process.

The "large" individual transplants are usually ready for transplanting into their final position once they have reached a height of 220mm and are approximately the width of a pencil (10mm).

'Welsh Leeks' planted by transplants have a more consistent yield and greater chance of success but incur a greater initial cost.

Dependant on the type, 'Welsh Leeks' can be planted or drilled in 3 or 4 rows between the tractor wheelings. When considering transplants (small or large), the plant density for a 3 row will typically be 50,000 plants per acre and when planting a 4 row this will be increased by approximately 33%. When drilling seed, the density is slightly more, with a density typically of 67,000 seeds per acre for a 3 row and when increasing to a 4 row the density per acre will increase again approximately by 33%.

Post planting management

Herbicides

As leeks are tall, strap-like plants, leeks do not provide thick ground cover and so potentially provide plenty of opportunity for weeds to flourish. Most weed control is undertaken by mechanical weeding but if required spraying is admissible.

Pest and disease

Due to the small acreage of the allium family grown in Wales, the aphid population is minimal and the incidence of pests and disease is low. In Wales it is very rare for routine

spraying of the crop for pest and disease management purposes, but if required spraying is admissible. The only disease that may sometimes occur would be leek rust during spells of wet weather and damp conditions or occasionally mildew. The prevalence of pest and disease is also much lower when growing leeks on the Welsh coast because of the occurrence of high winds from the Atlantic Ocean, which minimises the spread of diseases. In the rest of the UK, leeks are more susceptible to diseases such as fusarium, white tip (phytophthora), rust and white rot and pests such as thrips, leek moth, onion miner and bean seed fly. White rot is soil borne and is a problem if leeks are grown too close in a stockless rotation, however, this is not a problem with 'Welsh Leeks' where at least 30% to a maximum of 90% of the rotation is under grassland and grazed by stock

Fertilisers

Leeks are naturally heavy feeders, however in Wales, 'Welsh Leeks' are grown in a rotation that provides inherent fertility from stock grazing and helps build the nutrients required by the crop. The natural fertility and organic matter provided by having grazing stock in the rotation, reduces the requirement for artificial fertilisers. In contrast, in most of the leek growing areas of the UK, leeks are grown as part of a stockless arable rotation.

The main requirement for leeks grown in Welsh soils is the pH level. Welsh soils are inherently acidic and there is a requirement to add lime to raise pH to achieve the index of 6-7, which is required for leek growth.

Irrigation

Due to the wetter climate of Wales and high winter rainfall figures, unlike in other parts of the UK, the need to irrigate 'Welsh Leeks' is very rare and would only occur in an exceptional dry season.

Harvesting

The majority of 'Welsh Leeks' are currently hand harvested which makes them an expensive and labour-intensive vegetable to grow commercially. Mechanical harvesting equipment for smaller growers is not readily available but is allowed if future advancements in technology were to make mechanical harvesting more viable in smaller fields. Unlike the East coast of England and mainland Europe, Leek production in Wales is often in small, inclined fields.

Leeks can tolerate standing in the field for extended periods. 'Welsh Leeks' that are sown in spring will be ready from Mid-August through until April/May, depending upon when they are planted. Compared to other leek growing areas, 'Welsh Leeks' take a long time to reach maturity which provides more time for their fuller flavour to develop. 'Welsh Leeks' are harvested as they reach the desired size, leaving smaller plants in the ground to increase in size and weight. The leek will continue to grow through the Winter, during any mild spell and will happily stay in situ until next Spring. Leeks are exceptionally hardy and can be left in place all Winter, but they are, susceptible to frost and will stop growing in frosty conditions. Coastal areas such as Pembrokeshire have relatively few frost days, which helps protect the quality of the product.

Post-harvest, the leeks are immediately washed and packed. Most 'Welsh Leeks' are sold fresh but can be kept if required in cold storage for a maximum of 4 weeks to balance customer supply and demand.

Packing

In order to ensure full traceability and authenticity, 'Welsh Leeks' must be packed in Wales.

'Welsh Leeks' are sold either loose or in packs of various weights according to customer requirements.

6. Link with the geographical area

The qualities, and reputation of 'Welsh Leeks' is directly attributable to its geographical origin.

This PGI application is based on the following three key factors: -

- 'Welsh Leeks' are a distinct product with specific characteristics directly linked to the geographical area from where it is grown and harvested.
- The difficulties associated with growing 'Welsh Leeks' in Wales, requires specific skills. This skill base exists and has developed in the designated geographical area.
- Reputation and historical importance of 'Welsh Leeks' grown in and associated with the designated geographic area.

It is this combination of both natural factors and human factors which define the characteristics of 'Welsh Leeks'

Natural geographical factors

'Welsh Leeks' grow in a manner adapted to their Welsh environment, producing a final product which has its own specific characteristics.

Soils and climate

Leeks are a challenging crop to grow commercially, with most crops grown in very fertile deep soils, where the leeks have a relatively short growing season and matures quickly.

However, in Wales, leeks are grown on less fertile soils primarily on Agricultural Land Classification Grade (ALC) Grade 2 and some grade 3 land. These soils, are relatively shallow and can be stony and in coastal areas of Wales such as Pembrokeshire on predominantly sandstone sandy loam soil. When 'Welsh Leeks' are grown on these less fertile soils their root structure is less prolific and less deep. Root structure influences the plants stability. Welsh coastal locations are often exposed to strong South Westerly winds. 'Welsh Leeks' have adapted to these growing conditions to produce a "strong" leek which have a wider girth compared to leeks grown in deeper soils in other parts of the UK. with a circumference ranging from 38 – 42mm. These 'shorter and fatter' leeks are able to withstand exposure from the 70mph + South Westerly winds which are a frequent occurrence on exposed Welsh coastal locations. Leeks grown in less windy areas have a tendency to grow taller and thinner.

The most suitable fields for growing 'Welsh Leeks' are fields with a sloping gradient to promote free draining. Free draining soils are essential when growing leeks in Wales due to Wales's high rainfall figures. Although these fields receive more rain, the soils free draining properties enables them to drain quicker. Leeks are not suited to be grown in waterlogged or poorly drained conditions. Free draining soils also allow seeds to germinate quickly.

Wales's high rainfall figures (averaging up to 1,479mm per year) means there is no need to irrigate the crop throughout the season unless in exceptional circumstances.

Another key difference is that leeks are normally grown as part of an arable stockless rotation whereas 'Welsh Leeks' are grown as part of a grassland rotation with between 30% and 90% of the rotation under grassland which is used for stock grazing. Leeks require nutrient rich soil, and stock grazing provides the natural fertility and organic matter to the soil for leek growth demanding less reliance on artificial fertilisers.

Coastal Welsh Counties are in a unique position to benefit from the warmth generated by the sea which is warmed by the North Atlantic Drift of The Gulf Stream. The Gulf Stream, is a powerful, warm, and swift Atlantic Ocean current that originates at the tip of Florida. The current helps keep the western coast of Great Britain warmer than the eastern side. This provides Welsh coastal counties with a more equitable and milder/wet climate than inland areas due to the sea having a cooling effect in summer and a warmer tendency in winter relative to the interior. The warming effect of the sea helps the soil to warm up earlier than in other parts of the UK, facilitating growth and minimises the risk of frosts. A severe frost can damage an emerged leek crop. The equitability of the Welsh climate, is hugely beneficial to the growth of 'Welsh Leeks'.

'Welsh Leeks' are normally planted from late Feb through to May and harvested from August through until April/May, with some crops remaining in the ground for up to 12 months. The milder Welsh - equitable climate means that the leeks can be left in ground without affecting their quality. This means that 'Welsh Leeks' mature slowly, the longer growing season providing more time for the "peppery" flavour and "earthy, sweet buttery aroma" to fully develop.

Different varieties are grown which mature at different times of the year and different locations are chosen depending on the harvest season. Early varieties are grown in sheltered south facing fields near the coast and late season varieties are grown at higher altitude to delay the leeks going to seed.

The difficulties associated with growing 'Welsh Leeks' in Wales, with its often-challenging growing conditions requires specific skills. This skill base exists and has developed in the designated geographical area.

As 'Welsh Leeks' are grown as part of a stock rotation, Welsh Leeks are grown on mixed farms where both stock rearing and arable growing are practiced. This requires an understanding and balancing of nutrient requirements of the leek crop with the nutrient value of livestock manure and improving the pH of the soil from as low as five to at minimum six.

The weed burden (when growing leeks) is very different when grassland (grazed by stock) is an important part of the rotation compared to an arable stockless rotation. One of the key drivers to success is the identification and eradication of each individual grass weed species before it overwhelms the crop. Weeds grow on average three times faster than any leek. Weed control is carried out primarily by mechanical hoeing, hand weeding, and the use of weed wipes and/or spraying if required. Most herbicides that control weeds have a very narrow spectrum of weed species that they control. Whilst permissible, most herbicides will

slow the growth of the leek plant and spraying is avoided as slower growth will give lower yields. All agronomic decision making is based on knowledge from BASIS and FACTS qualified in house and external agronomists.

Harvesting – The majority of ‘Welsh Leeks’ are hand harvested. The grower loosens the soil by putting a blade underneath, each team will walk a row selecting the leek to meet specification, trim the roots to the base of the plate and will trim part of the flag and skin the outer leaves off the shank and brought in to be immediately washed and packed. Mechanical harvesting equipment for smaller growers is not readily available, although this would not be ruled out with future advancements in technology that are more effective in small fields.

The key skills associated with harvesting ‘Welsh Leeks’ are listed below:

- Ensuring the production plan has crop continuity with the range of varieties, soil types and locations that allow harvest all through the season.
- Predicting harvest maturity and yield to align with customer’s requirements. Particularly important around St David’s Day, the patron saint of Wales’s where the demand for ‘Welsh Leeks’ is at its greatest. This is done by manually checking the crop but also through crop forecasting models and bespoke agronomy for each field and variety.
- Hand harvesting which allows the option to walk through and harvest the crop more than once. This allows us to have better crop uniformity, yield and less wastage.
- Hand harvesting leeks is a very demanding job even in the milder Welsh climate. The harvesting team understand customer requirements, to harvest leeks which meet buyers ‘Welsh Leeks’ specifications.
- Most ‘Welsh Leeks’ are sold fresh within 24-72 hours. In season, ‘Welsh Leeks’ are harvested and brought in from the field in to a controlled environment in order to preserve the quality of the leek. This ensures shelf life but also reduces the risk of telescoping. All ‘Welsh Leeks’ should be grown in fields close to the main storage and packing sites.

Reputation and History

“There aren’t many vegetables that can pride themselves on having the symbol of a nation. The leek however, has been intertwined with Welsh culture for centuries and continues to play a key role in the nations cuisine” National Geographic Traveller International supplement October 2021

Phoenician traders are said to have introduced the leek to Wales when they were trading for tin in the British Isles – an act that would unexpectedly elevate this humble vegetable to national status thousands of years later. Leeks are also one of the few cultivated vegetables mentioned by name in the laws of the tenth century Welsh Prince Hywel Dda.

The leek became part of Welsh folklore when it was worn as a national identification badge by the Welsh troops who defeated the Saxons at the Battle of Heathfield in 633. Legend has it that in 640AD, the Briton King Cadwallader and his men were engaged in battle with invading Saxons. A Celtic monk named David persuaded the Welsh army to distinguish

themselves from their Saxon enemies by wearing a Welsh Leek in their helmets. The army went on to gain a great victory over their opponents and won the battle and the leek was subsequently referred to, as a good luck charm for the Welsh. David the monk became St David (or Dewi Saint as he is known in Wales) the patron Saint of Wales.

Another theory about the leek as a National emblem of Wales developed out of general belief that St David the Welsh patron saint was able miraculously to survive on a diet of leeks and water. During the Middle Ages when Saint David was alive the leek was seen as a healthy and virtuous plant with “extraordinary qualities” - high in fibre, good for purging the blood, keeping colds at bay and healing wounds.

During the Middle Ages the leek also acquired mystic virtues. It was claimed that Welsh girls who slept with a leek under their pillow on St David’s Day would see their future husband in their dreams. Later at a time when the Christian religious festival of Lent was important, and meat could not be eaten, historically leeks provided a useful and sustaining form of vitamins.

In the fourteenth century it is known that the feared Welsh archers also adopted the green and white colours of the leek for their uniforms at the battle of Crecy.

The Welsh Leek (and also the daffodil) were adopted widely as Welsh emblems during the War of the Roses in the Fifteenth century, The coat of arms of Henry Tudor (later to become King Henry VII of England) were green and white, so Welsh followers were said to have adopted the emblems of the leek and their daffodil with their symbolic greenish white stems. In Welsh the daffodil is known as Peter’s Leek. ‘Cenhinen Bedr’. Earliest reference of the leek as a Welsh emblem was when Princess Mary, daughter of Henry VIII was presented with a leek by the Yeoman of the guard on St David’s day in 1537. This reference to the leek as a Welsh emblem is found in the Account Book of Princess Mary Tudor.

Alongside other national emblems of countries, the Welsh Leek appeared on the coronation gown of Elizabeth II and the ‘Welsh Leek’ is still currently the cap badge of the Welsh Guards - a battalion within the Household Division of the British Army. The leek is worn in the caps of today’s Welsh soldiers every year on St David’s Day.

‘Welsh Leeks’ are listed in several major Welsh retailers; The Welsh consumer in particular, shows a clear preference for both the products provenance, plus its specific characteristics of size, diameter and abundance of green flag which provides the consumer with a “strong fresh flavour” and ‘starchy, earthy, sweet buttery aroma”

“Here at the Co-op, we are committed to regional sourcing strategies, recognising that our members seek out produce local to them. ‘Welsh Leeks’ are one of those key products, with a rich growing history across many fantastic locations within Wales. Our Welsh members, look out in our stores, for their distinct green coloured lengthy flag, strong earthy aroma and fresh flavour, which is historically demanded by the Welsh consumer” Buyer from the Co-op.

‘Welsh Leeks’ has the reputation of being a product that epitomises a strong sense of place and provenance and is found in numerous iconic Welsh recipes such as Cawl (soup) Welsh manufacturers such as butchers Edwards of Conwy always specify ‘Welsh Leeks’ to include in their products such as Welsh Pork and Leek sausages.

“When it comes to leeks it has to be Welsh, they provide an exceptional sweet-vegetable flavour over other leeks, complementing our savoury sausage seasoning for optimal flavour. The proportions of the tender light green and white stems and the abundance of green flag mean we get a consistent, balanced flavour and an exceptional green fleck throughout our sausages. It is without doubt that use of these particular ‘Welsh Leeks’ has contributed towards the success of our finished product, which has won a coveted Great Taste Award.”

Marketing Manager at Edwards of Conwy.

7. Inspection body

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The inspection body conforms to the principles of ISO 17065 standard.

8. Labelling

ENDS