Nº. 005

agricology.co.uk

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Low-Input Dairy Technical Guide

Farm practices and financial models to support the transition to lower-input systems



Agricology



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Front cover image photo credit: Janie Caldbeck

About this guide

This guide is designed to support UK dairy farmers, advisers and industry stakeholders who are considering a transition towards lower-input systems. It focuses on the practical realities and costs of change: what needs to shift on farm, what investment may be required, what challenges are likely to arise, and how different transition pathways can be managed.

The guide draws on economic modelling work, expert interviews, farmer experience and scientific literature. Rather than presenting a single 'ideal system', it recognises that farms start from very different positions. Land type, infrastructure, herd genetics, milk contracts, labour availability and financial resilience all shape what is possible, how quickly change can happen, and what it may cost.

The guide is structured around principles, pathways and practical decisions, rather than prescriptive recommendations. It is intended to help readers:

- understand what low-input systems are trying to achieve;
- anticipate key hurdles, risks and cost pressures;
- make informed decisions about investment, management and timing of transition.

The focus is on low-input dairy systems, which includes regenerative, organic and pasture-based approaches, with particular attention on reducing reliance on purchased fertiliser and feed, increasing production from forage, and improving long-term resilience.

What does it cost, in time, money and management change, to move towards a lower-input dairy system?





What is low-input dairy?

Low-input dairy systems are best understood not as a fixed set of practices, but as a set of underlying objectives that shape how a farm operates. These objectives influence decisions around feeding, grazing, breeding, infrastructure and overall system design.

At their core, low-input systems aim to reduce dependence on purchased inputs while maintaining a viable and resilient dairy business.

Importantly, the goal is not simply to reduce inputs, but to redesign the system so that it functions more effectively as a whole. This involves changes in grazing management, forage production, nutrient cycling and herd genetics.

The sections that follow take these changes in turn: producing milk from home-grown forage; building fertility on farm; and herd genetics and system fit.

Why consider a low-input dairy system?

There is no single 'right' dairy system. Profitable businesses can be found across the spectrum, from high-output herds producing large volumes of milk to lower-input, forage-led systems focused on controlling costs. The key question is not which system is best, but which system is best suited to your farm, your resources and your appetite for risk.

High-output dairy farms can be efficient and profitable, particularly where costs of feed, forage and labour are converted into milk very effectively. However, greater reliance on bought-in inputs can also leave businesses more exposed to rising costs and market volatility. When feed, fertiliser, energy or bedding prices increase, or when milk prices fall, margins can come under significant pressure, particularly when working capital is already under strain.

Pressures on dairy businesses

Farm-level risks are intensified by wider structural pressures across UK dairy farming. Dairy businesses operate in a food system shaped by sustained pressure on farmgate prices, supply chain concentration, competition for land, and changes in farm structure and land ownership.[1] These factors influence both the prices farmers receive and their ability to absorb periods of high cost or low return. Between April 2016 and April 2026, the number of dairy producers fell by 2,736, a decrease of around 29%, illustrating the scale of change taking place across the sector.[2]

A low-input approach offers farmers a possible strategy to reduce exposure to external input volatility.





Photo credit: Janie Caldbeck

Several factors continue to influence the financial resilience of dairy businesses:

- **Input cost volatility:** Sharp increases in fertiliser, feed and energy prices have placed significant pressure on margins. The cost of key inputs including energy, fertiliser, feed and diesel has risen by around 38–50% over a 5-year period, significantly increasing cost pressure on farm businesses.[1] Where these costs are not offset by milk price increases, efficiency gains, or changes in input use, profitability is reduced and financial risks increased.
- **Milk price variability:** Fluctuations in farmgate milk prices make long-term planning difficult and increase exposure to market shocks. Alongside this, reductions in milk price can have a significant impact on margins, especially in periods where falling milk prices are not fully offset by lower input costs.[3] Ultimately, profit is determined not by milk price alone, but by the relationship between milk income, production costs and technical efficiency.
- **Climate and weather risk:** Weather is becoming increasingly unpredictable. Extreme weather events such as droughts and floods can affect grass growth, forage quality and feed availability. This creates uncertainty and can increase the need for purchased feed, adding further cost pressure.
- **Emissions performance:** Growing pressure to reduce dairy emissions, particularly methane, could increasingly affect farm profitability as processors link contracts or incentives to emissions performance. Higher-output systems may have lower emissions per litre, while lower-input systems may offer greater potential for land-based carbon storage, and therefore quicker pathways to net zero. The ability to reduce emissions and access emerging public and private agri-environment incentives could therefore become an increasingly important influence.



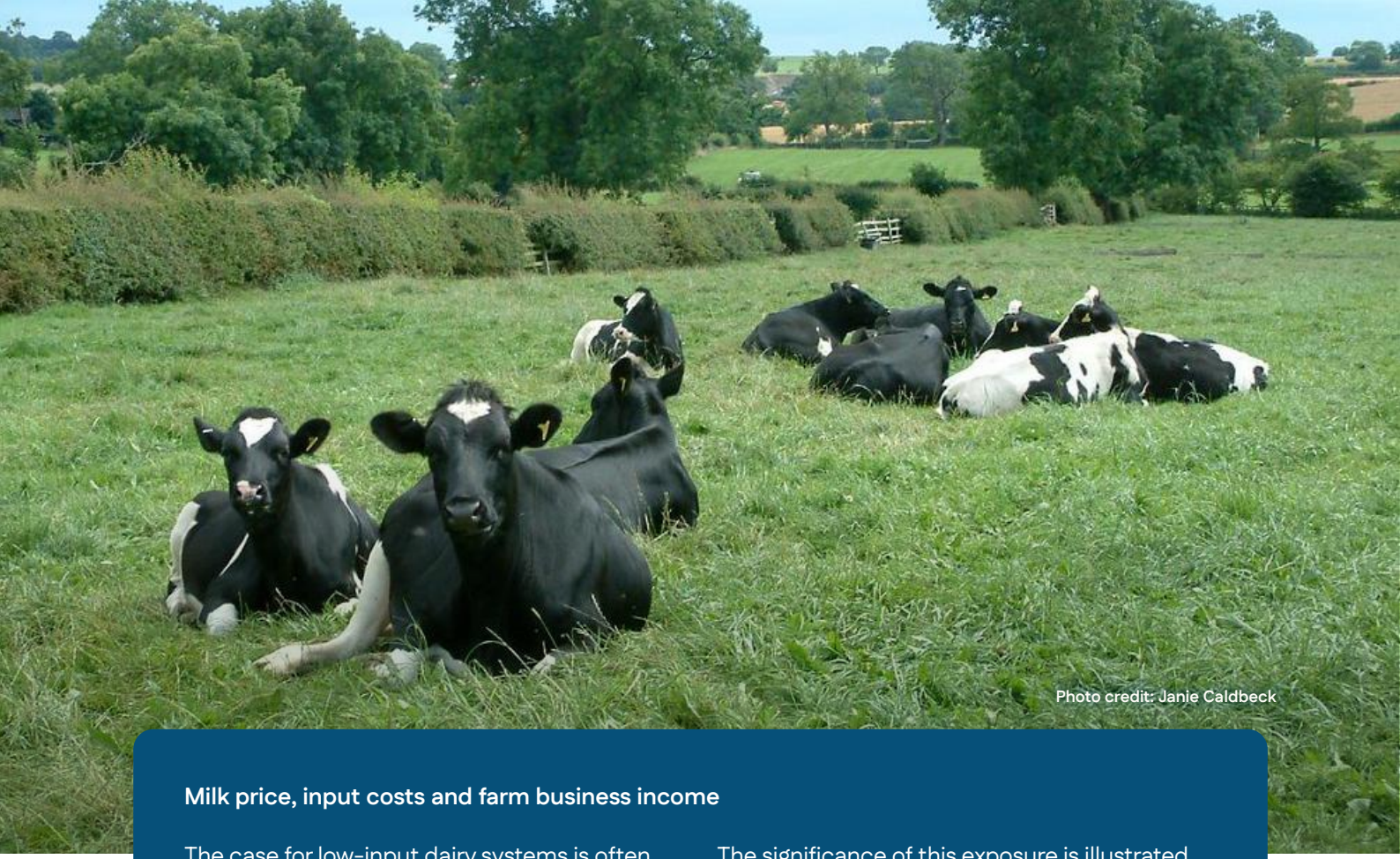


Photo credit: Janie Caldbeck

Milk price, input costs and farm business income

The case for low-input dairy systems is often made on efficiency grounds alone, without considering the drivers of cost volatility they aim to avoid. Milk price, feed price and fertiliser costs have all moved sharply and unpredictably over the past decade, often out of step with one another. It is this volatility that has driven much of the swing in farm profitability. Systems with lower reliance on purchased feed and fertiliser are, by design, less exposed to it. The key question is where profitability comes from, how dependent it is on purchased inputs, and how exposed the business is when prices move.

Data from AHDB's analysis of Great Britain (GB) dairy herd performance demonstrates that full costs of production are consistently 20–25% lower in the top 25% of herds compared to the bottom 25%,[4,5] highlighting the importance of cost control and input efficiency in determining profitability.

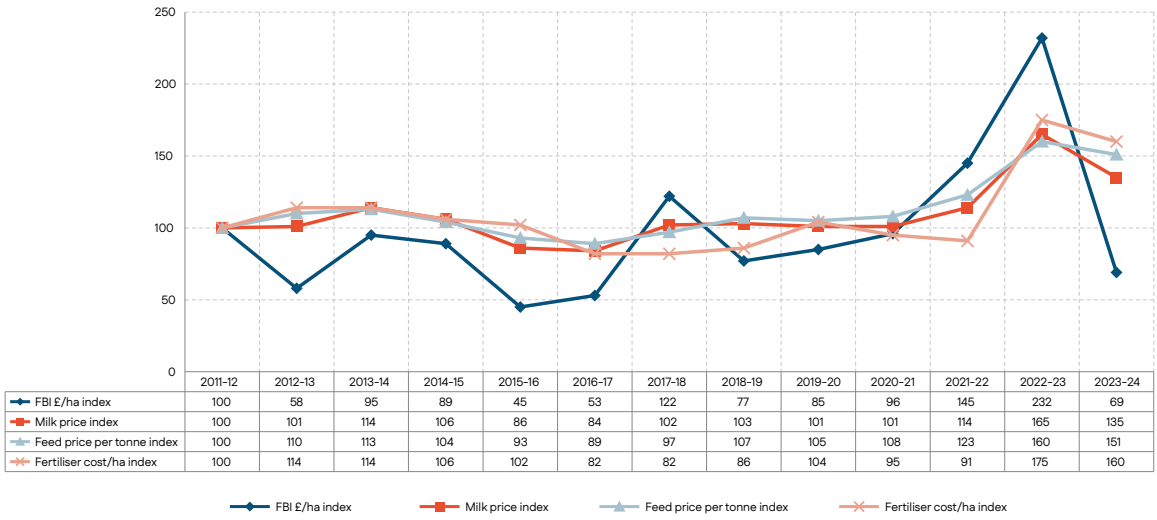
Kingshay/AHDB costings data show that milk from forage accounted for around 27–34% of total milk production by financial year between 2011–12 and 2023–24.[6–11] The remaining share of output is more exposed to purchased feed costs. The issue is therefore not whether farms use forage, but how much of the wider production system is exposed to external input costs.

The significance of this exposure is illustrated when using Farm Business Income (FBI) - Defra's measure of net farm profit – as an indexed comparator to milk price, feed price per tonne (t) and fertiliser cost per hectare (ha) (Figure 1). It shows that the relationship between milk price and input costs is more important than either measure alone. In years where milk price tracks at, or above, key input cost indices, FBI tends to be more resilient. Where feed and fertiliser costs rise faster than milk price, income appears more exposed. This does not mean that lower-input systems are automatically more profitable, or that higher-output systems are inherently more vulnerable, but it helps explain why reducing reliance on volatile purchased inputs may be attractive for some farms.



How to read this chart

This chart compares changes in FBI, milk price, feed price and fertiliser costs. Each starts at 100 in 2011–12: 150 means 50% higher than then, while 80 means 20% lower.
This shows whether milk prices have kept pace with rising input costs, and how farm income has responded.



	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
FBI £/ha index	100	58	95	89	45	53	122	77	85	96	145	232	69
Milk price index	100	101	114	106	86	84	102	103	101	101	114	165	135
Feed price per tonne index	100	110	113	104	93	89	97	107	105	108	123	160	151
Fertiliser cost/ha index	100	114	114	106	102	82	82	86	104	95	91	175	160

Figure 1: Farm Business Income for non-organic dairy relative to feed, fertiliser and milk price changes[6–11]

The results demonstrate that 2017–18 was relatively favourable, with milk price ahead of feed and fertiliser costs. In 2022–23, milk price rose strongly and helped offset high input costs, supporting a strong year for FBI.[6] In 2023–24, by contrast, feed and fertiliser costs remained much higher relative to milk price, creating a sharp squeeze for farms reliant on purchased inputs.

System flexibility, trade-offs and the central question

The ability to cope with volatility depends on more than the level of production or system intensity. Cost control, technical performance, debt levels, labour availability and management flexibility all influence how well a business can withstand challenging periods.

Transitioning to a low-input system is not without risk. For some farms, transition may involve lower output in the short term due to increased management complexity, and the need for upfront investment. For others, the focus may be on maintaining production while reducing exposure to purchased inputs, improving forage use, or stabilising margins. Resilience therefore is dependent on both sides of the equation: reducing exposure to volatile costs where possible and improving how effectively inputs are converted into output where they are still required.[3,12]

Understanding these trade-offs is essential. The sections that follow therefore look at what it costs to reduce exposure to external inputs, how long those changes take, and which farms are best placed to benefit from different transition pathways.



Producing milk from home-grown forage

Milk from forage

A central principle of low-input dairy is producing a greater share of milk from home-grown forage, including grazed grass and conserved forage. Forage is generally the lowest-cost feed source available to dairy farms, but it has practical limits: it is bulky, intake is constrained, and performance depends on forage quality, grazing management, calving pattern and cow type.

A useful benchmark for very strong forage-based performance is around 4,000 litres from forage per cow per year, or working towards approximately 60% of total milk from forage in lower-output, pasture-led systems.

This matters because milk produced beyond the forage base is more exposed to purchased feed costs. This was demonstrated in 2022-23, when average concentrate feed price rose to £358/t, up approximately 30% from £275/t the previous year.[13] Improving milk from forage can therefore reduce exposure to feed price volatility, but it may require changes to swards, grazing management, conserved forage quality, herd genetics and breeding, and infrastructure. The cost of transition towards increasing milk from forage depends on the farm's starting position and how much of this change can be achieved through management, and how much of this change requires investment or system re-design.

Choosing and establishing leys

Leys are a core part of the transition to lower-input dairy because they determine how much feed can be grown on farm, how much fertility can be supplied through legumes, and how far the business can reduce reliance on purchased feed and fertiliser. The economic case for changing leys depends on the starting point. Productive, well-structured grassland with useful clover may need better management rather than full reseeding. Tired, compacted, weed-dominated or fertiliser-dependent swards may need more active intervention.

The Organic Farm Management Handbook[14] notes that improved pasture in much of the UK is capable of growing over 12 t dry matter (DM)/ha, compared with a UK average of around 8 t DM/ha. Red clover swards are reported at around 10 t DM/ha on average, with a range of 9–15 t DM/ha. These figures suggest that sward performance can make a significant difference to the amount of home-grown feed available.

Ley species composition should fall in line with the way in which a field is used. Milking-platform fields need persistent, palatable leys that can support regular grazing and recovery. Silage fields may justify short-term red clover or Italian ryegrass mixtures where the priority is high-quality conserved forage. Diverse herbal leys may be used where drought resilience, rooting depth, mineral uptake or biodiversity are priorities. In practice, mixture choice needs to be matched to soil type, grazing or cutting regime, expected ley life, and what the farm is trying to achieve through the transition.

Establishment is both a technical and financial decision. Full reseeding gives the best opportunity to reset a poor sward, address weed or compaction issues and establish a designed mixture, but it has higher upfront costs and may temporarily reduce available grazing or silage area. Overseeding or stitching-in clover is less disruptive and usually cheaper but can be more weather-dependent and less reliable. Establishment success depends on timing, seed-soil contact, soil moisture, rolling and follow-up grazing management.



Indicative low-input ley establishment and annualised costs

Table 1 outlines the establishment costs and annualised costs for some typical low-input and organic leys. Establishment is paid upfront but is spread across the expected life of the ley alongside average annual variable costs. This is why the cost per year (yr) falls as ley life increases. If a ley fails or needs to be replaced early, the annual cost rises sharply because the establishment cost has not been spread over enough productive years.

Table 1: Indicative organic/low-input ley costs over a decade[14]

Ley type	Seed rate	Approx. seed cost	Approx. annual cost if kept 1 year	If kept 4 years	If kept 7 years	If kept 10 years
Standard ley	30 kg/ha	£210/ha	£290/ha/yr	£130/ha/yr	£110/ha/yr	£100/ha/yr
Diverse mixture	32.5 kg/ha	£230/ha	£300/ha/yr	£130/ha/yr	£110/ha/yr	£100/ha/yr
Long-term red/white clover with herb mix	32.5 kg/ha	£260/ha	£340/ha/yr	£140/ha/yr	£110/ha/yr	£100/ha/yr



Photo credit: Alice Farmery

Photo credit: Duncan Elliott



Photo credit: Janie Caldbeck

Grazing management

Grazing management is one of the main levers for reducing purchased feed and housing-related costs in lower-input dairy systems. The aim is to increase the use of grazed grass while allowing swards sufficient recovery time between grazing events. Timing matters: younger, pre-seeded grass generally has higher feed value and can support higher milk yields, while taller or longer-rested grazing may offer benefits for soil recovery, rooting depth and biodiversity, depending on the farmer's objectives.

Practical guidance comparing grazing methods suggests paddock grazing can achieve around 65–80% grass utilisation, compared with around 50% under set stocking, although outcomes depend on grass growth, weather, soil conditions and management skill.[15]

The cost and practicality of making changes on your farm will depend largely on your current system. If you already use paddock grazing, you may only need to make relatively modest adjustments such as improving grass allocation, extending rest periods, or measuring grass more consistently. If you are moving from set-stocking or a housed system, you may need to invest more in infrastructure such as tracks, fencing, water troughs, gateways and paddock design.

Regenerative standards often measure progress through rotational or adaptive grazing, including shorter grazing periods, longer rest periods and a higher proportion of pasture managed rotationally.

For dairy systems, investment costs need to be read alongside grazing performance. The Farm Advisory Service (FAS) guidance[15] recommends that milking cows enter paddocks at around 2,800–3,000 kilogram (kg) DM/ha and leave a residual of around 1,500 kg DM/ha, equivalent to a post-grazing height of 4–5 cm. It also stresses the three-leaf rule: grazing too late reduces feed quality as older leaves die back, while grazing too hard weakens the plant and slows regrowth. The paddock rest period should be adjusted according to grass growth, but a typical guide is 15-21 days in spring, 25-30 days in summer and 30-40 days in autumn.

Using the FAS example, a paddock with 2,800 kg DM/ha at entry and 1,500 kg DM/ha residual provides around 1,300 kg DM/ha of available grazing. At 15 kg DM/cow/day from grass, this would support around 87 cows for one day on a 1-ha paddock. This means ley costs, grazing management and herd demand need to be considered together: a sward that is cheap to establish but cannot reliably reach target covers, recover after grazing, or support planned intakes, may not reduce purchased feed exposure in practice.

Stocking rate is the other half of the grazing equation. Conventional systems often stock at around 2–2.5 cows/ha, while lower-input systems tend to run closer to 1.5–1.85 cows/ha depending on land quality and forage production. Lower stocking rates can reduce spending on purchased feed, fertiliser, veterinary treatments, replacements and labour, but they also reduce milk sales and leave overheads spread over fewer litres.



Indicative grazing infrastructure costs

Improving swards may also require investment in the infrastructure needed to use them well. For farms moving towards rotational grazing, this can include fencing, water pipes, troughs and tracks. These costs are highly farm specific. A compact grazing area close to the parlour may require relatively little new infrastructure, while a fragmented or wet grazing block may need more tracks, water points and fencing.

Table 2 shows an indicative worked example based on a 100-ha grazing area. These figures should be adjusted to reflect your actual farm layout, existing infrastructure and grazing plan.

Table 2: Indicative grazing infrastructure costs

Item	Assumed cost	Approx. cost per ha
Fencing	£3/m	£705/ha
Water pipe	£3/m	£705/ha
Troughs	£200 per unit	£94/ha
Tracks	£60/m	£1,269/ha
Total		**£2,773/ha**

In this example, tracks are the largest cost. Distance from the parlour, field access, soil type and existing tracks can therefore have a major effect on the cost of moving towards a more grazing-based system. Fencing and water costs will depend on how fields are split for grazing, while trough costs are relatively small in comparison.



Photo credit: Janie Caldbeck

Building fertility on farm

High-input systems import nutrients through purchased feed, fertiliser and organic amendments, but only a fraction of what comes in is converted into milk. The rest accumulates in soil and water. This isn't only a farm-level issue: nitrogen (N) and phosphorus (P) are two of the few global nutrient cycles where agriculture is already judged to be operating at high risk, with worldwide N use efficiency estimated at only 42%.[16] The economic signals that govern day-to-day farm decisions don't reflect this.



Milk is the signal the system can measure and reward, while nutrient accumulation, declining soil biology and growing regulatory exposure are the costs it defers.

Clover and legumes

Reducing reliance on purchased fertiliser is another core target for low-input dairy. The aim is not simply to remove fertiliser and accept lower forage production, but to replace part of its function through legumes, better use of slurry and farmyard manure (FYM), and more precise nutrient planning. Useful indicators include purchased fertiliser use per ha, fertiliser cost per ha, soil pH and P and potassium (K) status, slurry and FYM analysis, and the proportion of grassland supported by clover or other legumes.

Legumes provide one route for reducing bought-in fertility. AHDB guidance shows that white clover has the potential to supply around 180 kg N/ha at 20–30% cover, rising to 240–300 kg N/ha at 40-60% cover.[17] These figures should be treated as potential contributions rather than guaranteed replacements, because performance depends on establishment, soil pH, nutrient status, grazing management and sward persistence.



Photo credit: Duncan Elliott

Making the most of slurry and FYM

Dairy systems also generate significant nutrients through manure and slurry (Table 3). The transition challenge is therefore not only how to bring fertility into the system, but how to retain, analyse and use nutrients already being produced on farm. There is a regulatory reason for this too: on farms receiving repeated applications of slurry, digestate and food waste materials, phosphorus indices often drift beyond the target range, bringing potential risk to the environment and risking regulatory constraints on further applications. Heavy metals from waste-derived amendments accumulate slowly and do not reverse.

Table 3: Gross excretion figure for nitrogen, phosphate, and potash by livestock category[18]

	Total N produced kg/animal/year	Total P_2O_5 produced kg/animal/year	Total K_2O produced kg/animal/year
Dairy cow yielding over 9,000 litres	115	52	92
Dairy cow yielding 6,000–9,000 litres	101	44	77
Dairy cow yielding up to 6,000 litres	77	34	61
Dairy heifer replacement, >13 months to first calf	61	25	58
Dairy heifer replacement, 3 to 13 months	29	10.3	24

Better slurry utilisation is particularly important for grassland nutrition. Typical cattle slurry contains around 2.6 kg N/m^3, while mechanically separated liquid cattle slurry is around 4 kg N/m^3, with useful levels of phosphate and potash.[18] Liquid slurry is valuable because much of the readily available nutrient is in the liquid fraction, making it better suited to timely and even applications to growing grass. The solid fraction contains more organic matter and P, so may be better targeted to fields or crops where those are needed.

Timing is as important as nutrient content. Slurry is often applied hastily when stores need emptying, but the best economic value comes when nutrients are applied when grass can use them. For silage ground, this may mean applications after a cut (where soil conditions allow) when crop demand is high. On grazing land, lighter and more frequent applications can help match nutrient supply to grass growth, but this depends on equipment, field access, soil type and storage capacity.

FYM behaves differently from slurry. Nutrients are released more slowly, so it is often better suited to fields where there is time for biological breakdown and where organic matter is needed. Traditional autumn or winter applications may suit some systems, but on free-draining soils they can increase the risk of potash and other nutrient losses before the following growing season. Application timing therefore needs to reflect soil type, crop needs, field conditions and the risk of nutrient loss.

Potash is a particular issue in lower-input forage systems. It is mobile in the soil and is removed in significant quantities through grazing, silage and slurry movement around the farm. A low-input system therefore needs to manage potash as a cycle: understanding crop offtake, analysing slurry and FYM, returning manures to the right fields, and avoiding unnecessary losses from yards, stores or poorly timed applications.



Photo credit: Phil Sumption



Photo credit: Phil Sumption

Soil health

Low-input dairy systems place greater emphasis on making better use of the resources already available on farm. In practice, this means improving soil structure, biological activity, plant diversity and nutrient cycling so that grass and forage crops can perform with less reliance on purchased inputs.

Good soil function depends on the basics being in place. Soil organisms need air, water, food, organic matter and a suitable mineral balance. Avoiding compaction is therefore critical. Driving on wet soils, or when soils are beyond their plastic limit, reduces air space, restricts rooting, damages structure and can impair drainage. Where soils are compacted, adding more nutrients may not solve the underlying problem because roots, water and soil biology are still constrained.

Long-term grass leys and perennial swards can help rebuild soil function by keeping living roots in the soil for longer. Roots help create pore spaces, support drainage, feed soil biology and contribute to organic matter over time. This is one reason why multi-year leys can be valuable in lower-input systems: they are a feed source and part of the farm's fertility-building infrastructure.

A useful way to approach nutrient management is to ask what the plant needs, and whether the limiting factor is supply, access or cycling. Phosphorus may already be present in many soils, but plant access can be limited by soil pH, compaction, poor structure, low biological activity or nutrient imbalance. Mycorrhizal fungi play an important role in helping plants access P and other nutrients, but their function can be affected where soils are chemically imbalanced, too acidic, or where nutrient levels are excessive. Magnesium can also influence K uptake, so balance matters as much as headline nutrient levels.

Recent research[19] highlights that high soil P suppresses the microbial phosphatase activity and mycorrhizal colonisation that would otherwise cycle nutrients without external inputs. The biological infrastructure that underpins long-term soil fertility is progressively switched off by these inputs.

Regular soil testing remains the practical starting point: standard tests for available P and K, pH, sulphur and organic matter, alongside nutrient management planning and targeted slurry or manure applications, provide the basic information needed. If these indicators are adequate but grass performance remains poor, the next question is often structural rather than nutritional.

A useful indicator of progress towards a low-input system is whether the farm can maintain adequate forage productivity while reducing purchased fertiliser use per ha over time. Organic standards prohibit purchased synthetic fertilisers, so fertility must be supplied through legumes, manures, slurry, composts and permitted inputs.





Photo credit: Alice Farmery



Capital for new equipment

Some transition costs relate to new farm equipment that enables better grazing, sward establishment or nutrient use. Equipment commonly associated with low-input dairying is outlined in Table 4. Not all farms will need to buy this equipment. In many cases, contractor use, hire or machinery sharing may be more appropriate. Contractor costs are estimated using the *Contracting Prices Survey*.[20] Where equipment is purchased, depreciation provides a simple way to estimate the annual cost of ownership. Capital grants are often available to subsidise the purchase of such equipment.

Table 4: Farm equipment relevant to low-input dairy farming, with indicative purchase and contractor cost

Equipment	Role in transition	Indicative purchase costs	Indicative contractor costs[20]	Notes
Direct drill / slot seeder	Overseeding clover, grasses or herbal ley species into existing swards	£75,000–£120,000	£77.69/ha	• High capital item for establishing or stitching species into existing swards. • If only needed on part of the farm each year, consider contractor use, hire or machinery sharing.
Slurry separator	Produces a liquid fraction better suited to precise and timely grassland application	£20,000–£60,000	£145/hr (capacity of ±100m^3/ hr)	• Cost depends on whether the unit is fixed or mobile, throughput, and specification. • Solid fraction holds greater value for fields needing organic matter or phosphorus.
Umbilical slurry system	Enables lower ground-pressure slurry application across grazing and silage land	£20,000–£35,000+	£145.25/hr	• Costs depend on hose length, pump requirements, reelers and existing slurry infrastructure. • Reduced trafficking and soil compaction compared with heavier tanker-based spreading. • Useful on grazing or silage ground where soil conditions limit machinery access.
Trailing shoe / dribble bar	Applies slurry more accurately to growing grass	£12,000–£22,000	£75.75/hr	• Dribble bar costs depend on working width, macerator, stone trap, pipework, connectors and tanker or umbilical setup. • Trailing shoe systems are generally similar but may cost more depending on specification.



Herd genetics and system fit

Herd genetics influence whether a lower-input dairy system is technically and financially viable. Matching the cow to the system is a crucial first step of transition.

A forage-based, grazing-led or organic system requires cows that can maintain health, fertility and production under the conditions the farm is trying to create. The question is not whether one breed is 'best', but whether the cow fits the forage base, housing period, grazing system, calving pattern, milk contract and feed strategy. A herd that performs well in a high-output system may not perform well if feed level, housing period or forage quality change too quickly.

High-yielding cows can work in lower-input or organic systems where the whole system supports them. Some high-output farms produce high levels of milk from forage through excellent silage quality, multiple cuts, high forage intakes and close ration management.

The main transition risk is mismatch. A large Holstein-type cow weighing around 700 kg, producing 8,500–12,000 litres and eating 2.5–3.5 t of concentrate cannot simply be moved overnight into a low-concentrate, pasture-led system without consequences. If the energy supply does not match the cow's genetic potential, the costs can manifest as lost milk, poorer fertility, loss of body condition, and metabolic stress, producing higher culling and welfare problems. Moving towards a herd better suited to lower-input production may therefore involve changes in breeding objectives, crossbreeding, replacement policy and culling decisions. Because replacement cycles are slow, changing the herd through breeding can take as long as 11 years, so a clear breeding plan, adhered to consistently over time, is essential.

Breed selection

For lower-input transition, the most relevant breed differences are often not headline yield outputs alone, but rather the balance between milk output, milk solids and maintenance requirements. A smaller cow may produce fewer litres, but may also require less concentrate, carry better fertility in a grazing system, and produce a higher proportion of fat and protein. Where processors reward constituents, milk solids per cow or per ha may be a more useful measure than litres alone.

Common breed and crossbreeding options include Irish or New Zealand Friesian, British Friesian, Jersey, Kiwi-cross, Scandinavian Red, Norwegian Red, Montbéliarde, Normande, Brown Swiss, Fleckvieh and structured crossbreeding systems such as ProCross. These options are often considered because of traits such as fertility, solids, longevity, robustness, feet and legs, or moderate mature size.

The important point is not necessarily to choose a breed label, but to define the target cow and breed consistently towards it.

A practical lower-input benchmark may sit around 6,000–7,500 litres per cow, with stronger milk solids and lower concentrate use than a high-output system. More grazing-led herds, particularly those with a high proportion of Jersey cows, may operate at around 4,500–5,500 kg of milk per cow from animals weighing roughly 475–525 kg, while feeding only around 500–750 kg of concentrates per cow. A smaller number of once-a-day (OAD) milking herds may operate at around 3,500–4,000 kg of milk per cow with little or no concentrate feeding. Around 550 kg milk solids per cow can be treated as a useful working benchmark, with 700 kg representing strong performance where the system and contract support it.

Differences in recorded breed performance are outlined in Table 5, relating to animals completing qualifying 305-day lactations. This does not, however, reflect which breed is most profitable in a lower-input system. Profitability depends on milk price, fat and protein payments, feed use, fertility, replacement rate, health, longevity and the cost of changing the herd.

Table 5: Comparative milk-yield benchmarks of UK-breed society registered dairy animals[21]

Breed	Average yield, kg/305 days	Top 25% threshold, kg/305 days
 Holstein	9,900	11,800
 Brown Swiss	7,800	9,200
 Montbéliarde UK	7,600	8,900
 Ayrshire	7,100	8,300
 Island Jersey	7,000	8,200
 British Friesian	6,600	7,600
 UK Jersey	6,300	7,500
 Guernsey	5,800	6,800

Key traits

For lower-input transition, breeding decisions need to focus on cow type as much as breed. Key traits include fertility, longevity, ability to maintain body condition, feet and legs, udder health, calving ease, moderate mature size, milk solids and the ability to convert forage into saleable output.

The following profile (Table 6), provided through expert input for this guide,[22] gives an example of a cow type suited to a spring-calving, forage-led system.

Table 6: Milk production profile example for a spring-calving, low-input cow[22]

Lactation	Milk (kg)	Fat (%)	Protein (%)	Liveweight (kg)
1	4,700	4.61	3.66	495
2	5,550	4.61	3.74	535
3	6,075	4.56	3.75	560
4	6,400	4.51	3.75	575
5	6,590	4.48	3.75	580

This kind of profile shifts the focus away from maximum litres and towards system fit: moderate liveweight, strong constituents, improving performance with maturity, and the ability to maintain production in a forage-based system.



Photo credit: Duncan Elliott

Pathways for changing herd genetics

Changing herd genetics is a long-term business decision and should be viewed as an investment in the future performance of the herd. While genetics can influence traits such as milk production, fertility, longevity, feed efficiency and suitability for grazing or low-input systems, any benefits take time to emerge and must be weighed against the costs of making the change.

The cost of transitioning to a different type of cow extends beyond the purchase price of replacement animals. Farmers also need to consider breeding advice, semen and breeding costs, heifer rearing expenses, cull cow values, herd health and biosecurity risks, and the potential impact on cashflow during the transition period. Depending on the approach taken, there may also be short-term effects on herd performance while the new genetics become established.



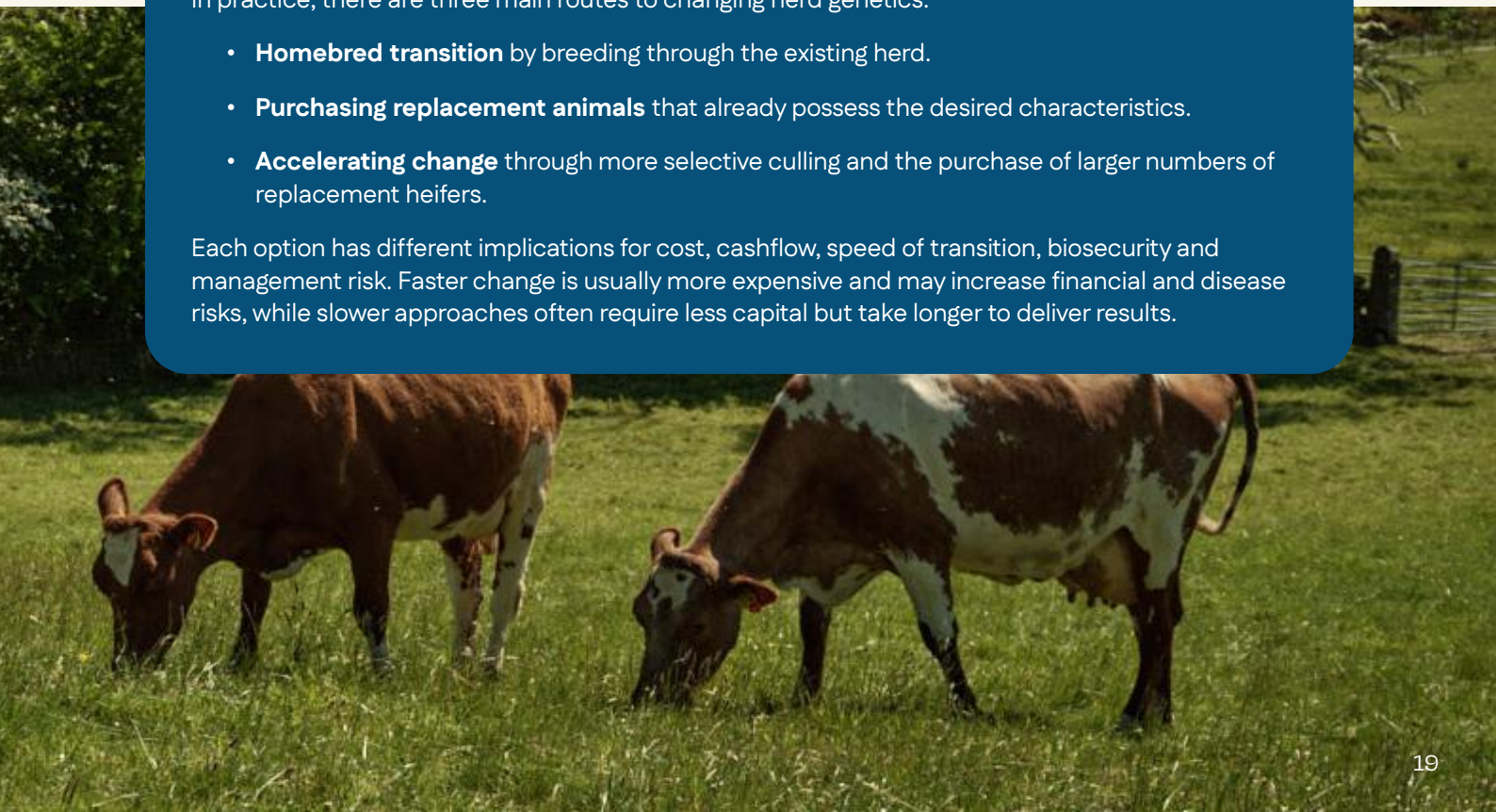
Unlike management changes such as reducing concentrate use or altering fertiliser applications, genetic change happens gradually.

Breeding through the existing herd can take several generations before the full impact is seen across the milking herd, meaning that benefits may not be realised for over 10 years.

In practice, there are three main routes to changing herd genetics:

- **Homebred transition** by breeding through the existing herd.
- **Purchasing replacement animals** that already possess the desired characteristics.
- **Accelerating change** through more selective culling and the purchase of larger numbers of replacement heifers.

Each option has different implications for cost, cashflow, speed of transition, biosecurity and management risk. Faster change is usually more expensive and may increase financial and disease risks, while slower approaches often require less capital but take longer to deliver results.



The following worked example (Figure 2) outlines illustrative costs and savings to be considered when establishing a transition plan. Milk production, replacement rate and concentrate use levels all fall in the transition from a *starting* cow to a *lower-input* cow, reflecting a forage-aligned herd. Costings are drawn from The Agricultural Budgeting and Costing Book[23] and expert interviews.[24]



Starting cow

Milk yield: 9,000 litres/yr

Replacement rate: 25-28%

Concentrate fed: 2.5 tonnes/yr

Switching away would mean lower milk income: 2,750 litres per cow/year - **£1,086**

Annual milk income at 39.5ppl



Lower-input cow

Milk yield: 6,250 litres/yr

Replacement rate: 18-22%

Concentrate fed: 0.75 tonnes/yr

Lower production costs: +£733 identified annual savings

£553 concentrate saving

£180 replacement saving

Figure 2

This example illustrates how moving towards a more forage-focused cow can reduce production costs but also reduce milk income. In this example, the lower-input cow produces 2,750 fewer litres per year, equivalent to £1,086 in lost milk income at a conventional milk price of 39.5 pence per litre (ppl). However, there are also important savings:

- **Concentrate feed savings – £553/cow/year.**[23] Reducing concentrate use from 2.5 to 0.75 t per cow saves 1.75 t annually, based on a concentrate price of £316/t. This represents a reduction in purchased feed expenditure, although any additional costs of producing home-grown forage must also be considered.
- **Replacement savings – approximately £180/cow/year.**[23] A cow better suited to forage-based production may achieve greater longevity and more lactations, reducing replacement requirements. The example assumes replacement rates fall from 26.5% to 18%, with replacement heifer costs of £1,850 and £1,350 respectively, and a cull cow value of £768.



Together, these changes offer approximately £733 in identified savings per cow each year. While substantial, they do not fully offset the reduction in milk income at the conventional milk price used here. To make a lower-input system financially viable, changes to cow type need to be accompanied by wider improvements in how the farm produces forage, manages nutrients, controls costs and markets its milk.

These include:

- **Improving forage production and utilisation** to support milk production from home-grown feed and reduce reliance on purchased concentrates.
- **Improving slurry and manure management** to make better use of nutrients already available on farm alongside clover and legumes to reduce purchased fertiliser requirements.
- **Reducing wider operating costs,** potentially including veterinary treatments, bedding, housing and slurry handling, where changes to the production system allow.
- **Securing a milk price that reflects the production system,** through contracts rewarding milk solids or forage-led production, or potentially an organic premium, where available and economically justified.

Ultimately, the transition is not simply about changing the cow but adapting the whole dairy system to produce milk profitably with fewer purchased inputs.

Photo credit: Duncan Elliott

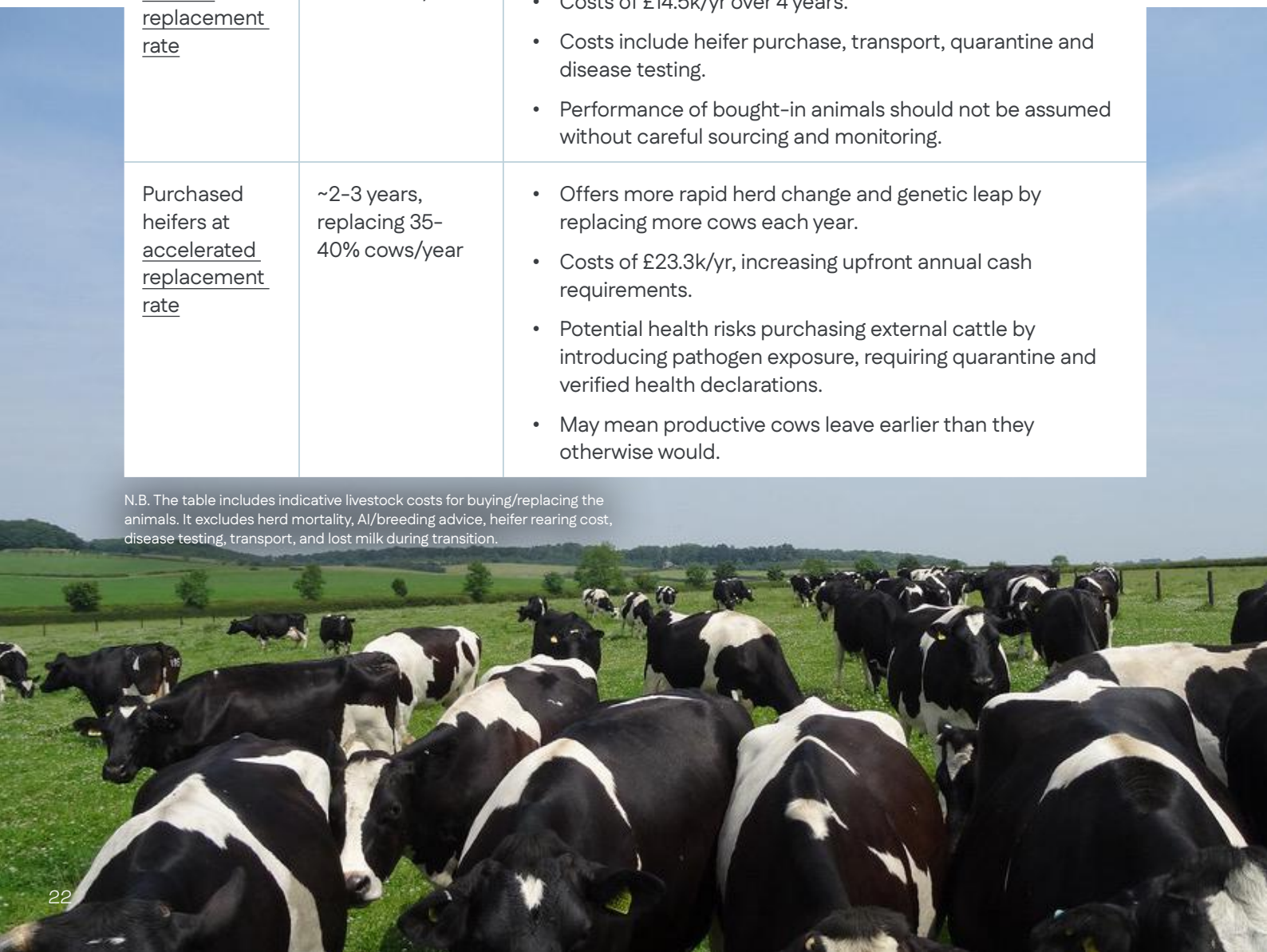
Comparing herd transition routes over an 11-year period

The scale and timing of three herd-change transition routes – using a 100-cow example herd – is compared in Table 7. The 11-year period reflects the approximate time needed to change the whole herd through breeding and genetics alone, providing a common timeframe for comparing faster transition routes. Costs associated with replacing the herd with purchased heifers equate to £58,000, based on replacing 100 cows with £1,350 heifers offset by £768 cull value.[23]

Table 7: Influence of herd transition routes upon livestock, breeding and cashflow

Route	Approx. time to full herd change	Livestock, breeding and cashflow
Homebred transition	~10-11 years	• Uses breeding decisions, sexed semen, recording and retained replacements to shift the herd gradually. • Genetic progress is slow. • Low upfront purchase cost. • A.I., sexed semen, advice, recording and heifer rearing need to be costed separately.
Purchased heifers at normal replacement rate	~ 4 years, replacing 25-28% cows/year	• Speeds up change by buying suitable replacements through the normal replacement cycle. • Costs of £14.5k/yr over 4 years. • Costs include heifer purchase, transport, quarantine and disease testing. • Performance of bought-in animals should not be assumed without careful sourcing and monitoring.
Purchased heifers at accelerated replacement rate	~2-3 years, replacing 35-40% cows/year	• Offers more rapid herd change and genetic leap by replacing more cows each year. • Costs of £23.3k/yr, increasing upfront annual cash requirements. • Potential health risks purchasing external cattle by introducing pathogen exposure, requiring quarantine and verified health declarations. • May mean productive cows leave earlier than they otherwise would.

N.B. The table includes indicative livestock costs for buying/replacing the animals. It excludes herd mortality, AI/breeding advice, heifer rearing cost, disease testing, transport, and lost milk during transition.





Cashflow during this time depends on transition speed. Breeding through the herd has the lowest upfront purchase cost but the slowest effect. Buying in replacements gives a faster change but requires more capital and introduces biosecurity risk. Accelerated replacement can shorten the transition period, but it brings more costs forward and may require productive cows to leave the herd earlier than they otherwise would, which is often associated with greater emissions intensity.

Regardless of approach, farms taking a data-led approach can make better informed breeding and replacement decisions. Whether this is processed through farm management software or elsewhere, having the fertility, health and genetic records of the herd improves the accuracy of genetic progress and keeps replacement decisions aligned with the long-term goals of the herd.

The economic case is not simply whether a lower-input cow replaces the milk income of a higher-output cow. It is whether the whole system can produce milk at a lower and more stable cost and for a better margin. That means reducing several cost lines together: bought-in feed, replacements, vet and medicine, bedding, housing, slurry handling and labour pressure.

A higher-value milk contract, organic premium, or stronger payment for fat and protein can improve the case but should not be assumed. Some farms may instead target a moderate-output herd, for example 7,000–7,500 litres, with stronger solids, fertility and longevity, reducing feed exposure without giving up as much milk output.

Transition pathways

Every farm will have its own starting point on a transition pathway. Some farms may already be technically efficient high-output businesses with strong feed conversion and good control of costs. Others may be closer to a lower-output, lower-input model, but still have opportunities to improve forage use, fertility management, milk contract alignment or overhead structure. The same transition pathway will therefore have very different implications depending on whether the farm is starting from an underperforming system, an optimised high-output system, or something in between.

Across these pathways, the aim is to improve margin rather than simply to reduce inputs or maximise output. Where a processor rewards butterfat and protein, milk solids per ha may be a more useful measure of performance than litres per cow. Lower intensity can also reduce output before the benefit of lower costs is felt, so each scenario below is judged on modelled net profit rather than on yield or cost savings alone.

The following sections use a worked example, developed through expert interview and in collaboration with The Dairy Group, to explore how different transition pathways affect output, input use, costs and profitability. The purpose is not to present a single 'best' model, but to show what changes on the same area of land when different approaches are adopted.

The *base case* is reflective of a real dairy farm, using actual 2024–25 data on milk output and price, feed and fertiliser use, farm accounts and fixed costs. The farm was selected because it faces constraints that are relevant to many dairy businesses considering change.

The analysis (Figure 3) compares four positions beyond the *base case*:

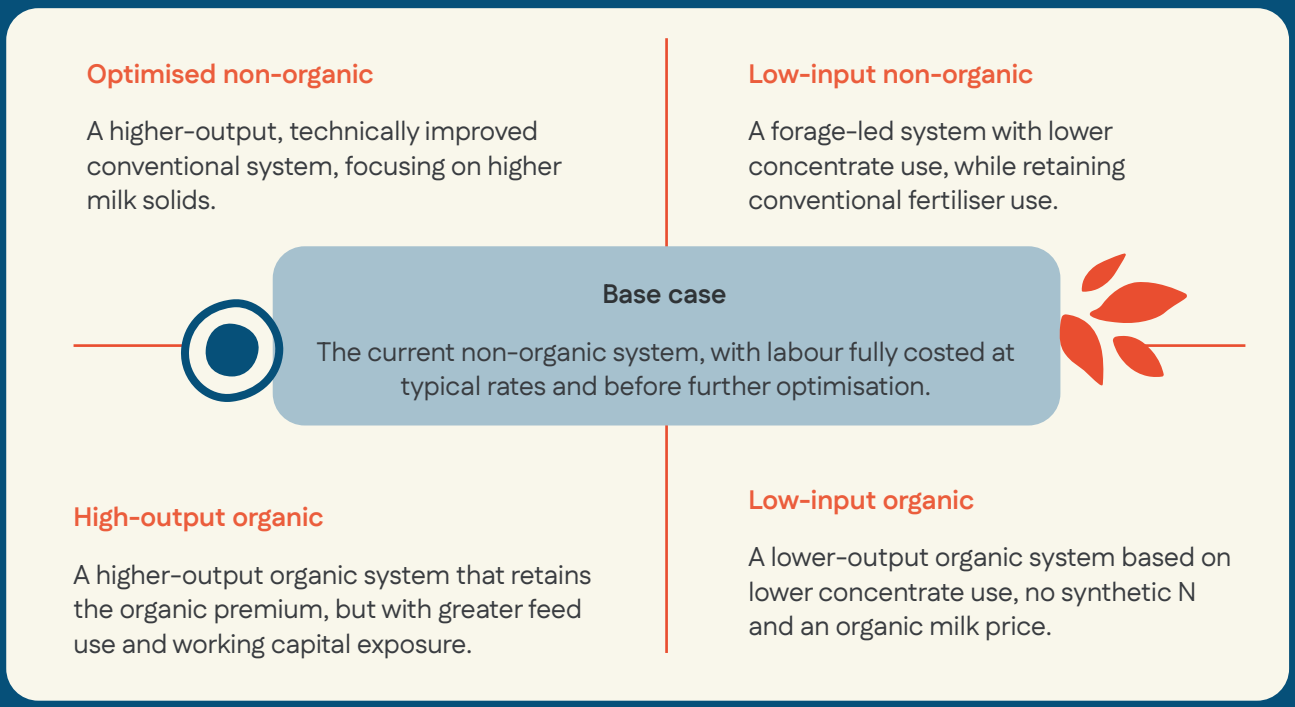


Figure 3

The modelling

The transition scenarios combine the farm data with 2025 dairy performance benchmarks, expert input, and technical assumptions for achievable changes in milk yield, concentrate use, milk from forage, stocking rate and fertility management. Farm-specific features were simplified where necessary to make the example more generalisable. These results assume organic contracts can be secured, which is not guaranteed. The scenarios should therefore be treated as worked examples rather than an assumption that every farm would benefit financially from transition; for some already well-performing businesses, the case for change may be much weaker under current market conditions.

Base case

The *base case* is a 135-cow, 125 ha tenanted dairy farm, producing 807,466 litres at 5,981 litres per cow and receiving 39.5 ppl in the year to March 2025. The farm currently buys in most heifer replacements. Soil fertility is a constraint, with current inputs providing ~17 kg N/ha, well below the required forage performance. Because housing and slurry storage are already at capacity, increasing cow numbers is not a realistic route to growth.

As Figure 4 shows, once the £38,313 labour cost is included, the *base case* produces a small net loss of around £10,800. In practical terms, the current system is not generating sufficient return to provide a full salary.

Scenario comparison

This comparison utilises several assumptions that are applicable to all scenarios in order to retain consistency and comparability with the *base case* farm, offering insight into how margin per cow and ha might be improved. The herd size and farm size remain at 135 cows and 125 ha, respectively. Heifer replacements are reared on farm in all scenarios, beyond the *base case*, raising the stocking rate from 1.08 to 1.35 Livestock Units per ha. Beyond this, housing and slurry storage is deemed to be at capacity with no scope for expansion. Labour costs are £38,313 in all scenarios.

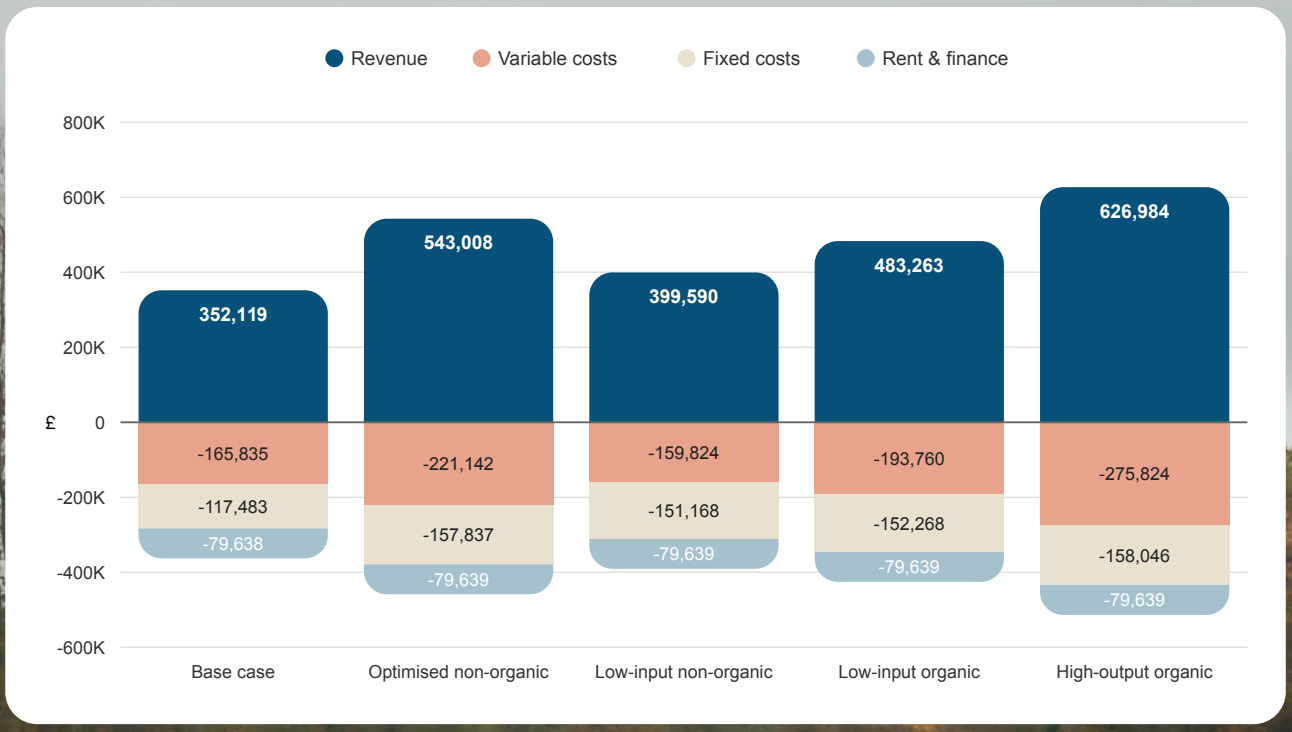


Figure 4 Comparative approach and financial performance of modelled transitional pathways

Photo credit: Janie Caldbeck

Table 8: Comparative approach and financial performance of modelled transitional pathways above the table

Parameter	Base case	Optimised non-organic	Low-input non-organic	Low-input organic	High-output organic
Yield (l/cow)	5,981	8,600	6,000	6,000	8,000
Concentrate use (kg/litre)	0.37	0.33	0.25	0.25	0.34
Milk from forage (l/cow)	1,537	2,924	3,000	3,000	2,560
Milk price (ppl)	39.5	42.3	42.9	53.2	53.2
Total concentrate (t)	300	380	203	203	367
Net profit (£)	**-£10,800**	**£84,300**	**£9,000**	**£57,600**	**£113,500**

Scenario 1: Optimised non-organic

Higher output increases concentrate use, and fertiliser spend rises to support a more productive forage platform. At a milk price of 42.3 ppl (the average for The Dairy Group aligned contracts over the period, at 4.4% butterfat and 3.4% protein[24]) the extra milk sales lift modelled net profit considerably, as Figure 4 shows. Profitability improves through output, forage performance and technical efficiency rather than lower purchased-input exposure. However, reaching this level (with yield rising 44% from the *base case*) takes years of improvement in genetics, nutrition, forage and herd health, and may need capital investment where housing, slurry storage or land are already at their limits. It is therefore a high-output benchmark rather than a practical or affordable pathway for every farm, and its exposure to concentrate and fertiliser prices is why lower-input approaches may suit some businesses despite lower modelled returns.

Table 9: Scenario 1: Optimised non-organic opportunities and challenges

Opportunities	Challenges
• Much higher milk sales • Higher profit potential • More revenue to cover fixed costs • Greater income buffer when prices are strong • Better feed efficiency per litre	• Big jump in cow performance • Higher total feed use • Much higher fertiliser requirement • Housing/slurry capacity constraints • Likely capital, land and fertility limits

Scenario 2: Low-input non-organic

The *low-input non-organic* scenario changes how milk is produced rather than how much. The gain in profit is relatively modest, indicating that feed savings alone are insufficient to transform profitability where labour, machinery, housing, bedding and herd replacement costs remain largely unchanged. This accounts for a small rise in milk price to 42.9 ppl, through a modest rise in solids to 4.5% butterfat and 3.5% protein, adding 0.65 ppl on top of the *optimised non-organic* scenario. The model also assumes a more productive grass platform supported by higher N and fertiliser use. Over time, greater use of clover, slurry and FYM could improve this further, with net profit potentially rising to over £27,000 if more fertility were supplied from farm-based nutrient sources.

Table 10: Scenario 2: Low-input non-organic opportunities and challenges

Opportunities	Challenges
• Similar milk output from fewer bought-in inputs • Increased milk from forage • Lower exposure to feed-price volatility • Potential to simplify the cost base	• Fixed costs must fall • Better grazing and silage needed • Some cows may not suit the system • More fertiliser needed to improve sward productivity • Possible grazing infrastructure investments

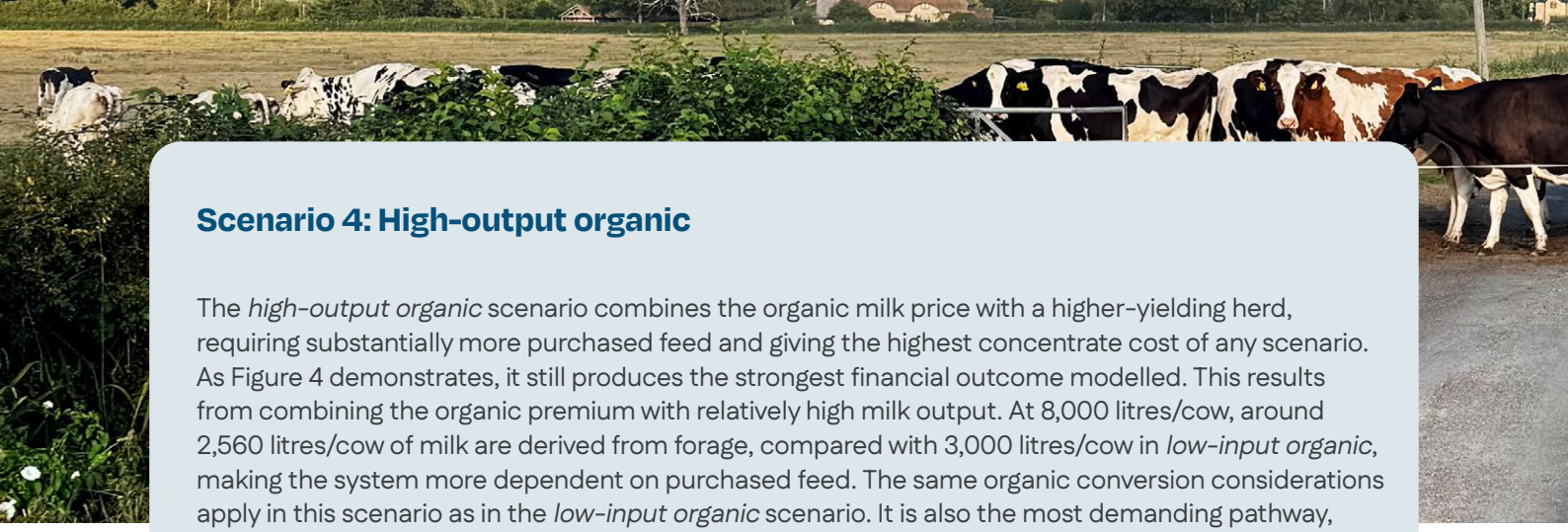
Scenario 3: Low-input organic

This scenario applies organic certification to the same forage-led system as *low-input non-organic.* Although organic concentrate is considerably more expensive, lower feed use, no synthetic fertiliser and the organic milk premium combine to lift modelled net profit substantially. The main challenge is the transition: during the 2-year conversion period, additional organic feed costs are estimated at around £26,000 before the organic milk premium is received. The pathway therefore depends on securing an organic milk contract, managing conversion cashflow, establishing productive clover swards and controlling purchased feed costs.

Table 11: Scenario 3: Low-input organic opportunities and challenges

Opportunities	Challenges
• Higher milk price from organic premium • Stronger margin from existing infrastructure • No synthetic fertiliser • Clover-based fertility • Helps address soil nutrient issues	• Securing an organic milk contract • 2-year conversion cashflow gap • Higher organic feed cost • Establishing productive clover swards • Organic management requirements

Photo credit: Janie Caldbeck



Scenario 4: High-output organic

The *high-output organic* scenario combines the organic milk price with a higher-yielding herd, requiring substantially more purchased feed and giving the highest concentrate cost of any scenario. As Figure 4 demonstrates, it still produces the strongest financial outcome modelled. This results from combining the organic premium with relatively high milk output. At 8,000 litres/cow, around 2,560 litres/cow of milk are derived from forage, compared with 3,000 litres/cow in *low-input organic*, making the system more dependent on purchased feed. The same organic conversion considerations apply in this scenario as in the *low-input organic* scenario. It is also the most demanding pathway, requiring sustained improvement in genetics, forage quality, herd health and management without synthetic N. It should therefore be viewed as a potential longer-term destination, with high exposure to organic feed costs and risk associated with conversion and milk contracts.

Table 12: Scenario 4: High-output organic opportunities and challenges

Opportunities	Challenges
• Highest profit potential • High milk sales plus organic premium • Strong revenue buffer when prices are favourable • No synthetic fertiliser • Higher output without more cows	• High organic feed costs • Major genetics and management lift • High forage-quality demands • Working-capital requirement • Organic conversion and milk-contract risk

Milk- and feed-price sensitivities

Milk and concentrate prices are two of the main external variables affecting profitability. Table 13 shows the change in annual profit from a 1 ppl movement in milk price and a £10/t movement in concentrate price, with all other assumptions held constant. This illustrates relative market exposure rather than predicting future prices.

Table 13: Impact of milk and feed price movement on profitability of each scenario

Scenario	Profit change from 1ppl milk-price movement	Profit change from £10/t concentrate-price movement
Base case	£8,075	£3,000
Optimised non-organic	£11,610	£3,800
Low-input non-organic	£8,100	£2,030
Low-input organic	£8,100	£2,030
High-output organic	£10,800	£3,670

Higher-output systems have greater upsides when milk prices are strong, but greater exposure when prices fall. A 5 ppl fall would reduce annual profit by around £58,000 in the *optimised non-organic* system and £54,000 in the *high-output organic* system, compared with around £40,500 in the low-input systems. Higher concentrate use also increases exposure to feed-price rises.

The following market sensitivity analysis shows how these parameters translate under different combinations of milk and concentrate prices, using the same production and cost assumptions across all five systems.

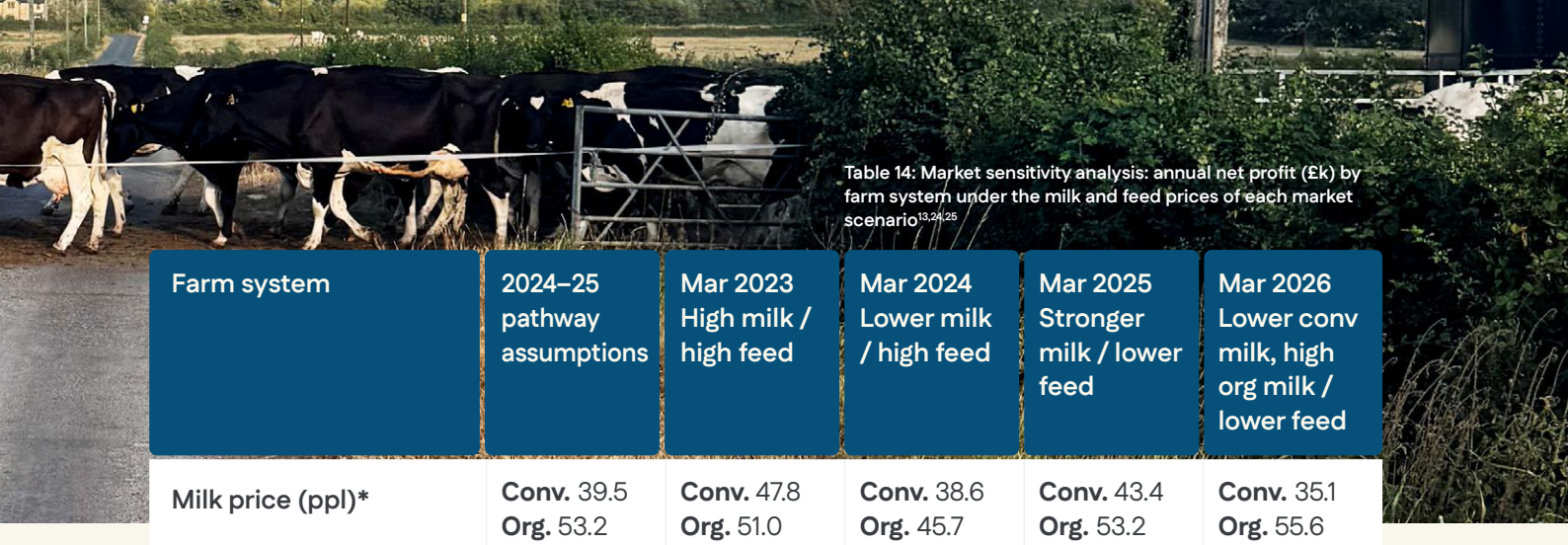


Table 14: Market sensitivity analysis: annual net profit (£k) by farm system under the milk and feed prices of each market scenario[13,24,25]

Farm system	2024–25 pathway assumptions	Mar 2023 High milk / high feed	Mar 2024 Lower milk / high feed	Mar 2025 Stronger milk / lower feed	Mar 2026 Lower conv milk, high org milk / lower feed
Milk price (ppl)*	**Conv.** 39.5 **Org.** 53.2	**Conv.** 47.8 **Org.** 51.0	**Conv.** 38.6 **Org.** 45.7	**Conv.** 43.4 **Org.** 53.2	**Conv.** 35.1 **Org.** 55.6
Feed price (£/t)	**Conv.** 323 **Org.** 474	**Conv.** 336 **Org.** 565	**Conv.** 324 **Org.** 524	**Conv.** 293 **Org.** 474	**Conv.** 292 **Org.** 430
Annual net profit (£k)					
Base case	−11	52	−18	30	−37
Optimised non-organic	84	174	72	140	44
Low-input non-organic	9	74	2	47	−20
Low-input organic	58	21	−13	58	86
High-output organic	114	56	14	114	156

Conv. = conventional; Org. = organic. Shading: red = loss, green = profit (darker = higher)
*For the optimised and low-input non-organic scenarios, milk price premiums of 2.8ppl and 3.4ppl respectively are maintained above the conventional milk price in each year, reflecting the assumed higher butterfat and protein content of their milk.

The sensitivity analysis shows that the relative profitability of the systems can change substantially with market conditions. In March 2023, high conventional milk prices and expensive organic feed favoured higher-output conventional production, with *optimised non-organic* generating around £174,000 (though only after a major, multi-year improvement in cow performance), compared with £52,000 for the *base case* and £21,000 for low-input organic. March 2026, shows the reverse: weak conventional milk (35.1 ppl), strong organic milk (55.6 ppl) and cheaper organic feed favoured organic production, with *high-output organic* generating around £156,000 against £44,000 for *optimised non-organic*. While higher-output systems can deliver greater profits, they may also require investment beyond the reach of some farms. For these businesses, the low-input systems offer an alternative, with fewer loss-making scenarios than the *base case* and greater potential to maintain a surplus for household drawings and reinvestment.

The low-input systems follow a different pattern, earning less than their higher-output equivalents in every market but with lower exposure to price movements. *Low-input non-organic* outperforms the *base case* in every market, by roughly £17,000 to £22,000 a year. Its weak point is March 2026, when a low milk price leaves it at a loss of £20,000, although greater use of its own manure, worth around £18,000, would help recoup this.

Low-input organic is the mirror image: it falls behind when organic feed is costly, with a £13,000 loss in March 2024, but earns £86,000 in March 2026. For both, profitability depends on securing a milk contract that rewards the system.

The results highlight a trade-off between profit potential and resilience. Higher-output systems can deliver much greater returns in favourable markets, while low-input systems reduce exposure to purchased-feed costs and may suit farms with limited scope for additional investment or output expansion.

Is securing an organic milk contract the right thing for me?

Because organic feed costs more than conventional feed, every kg/litre reduction in concentrate use saves more money in an organic system.

Considering March 2025 milk prices for conventional (43.4 ppl) and organic (53.2 ppl) in conjunction with feed costs for conventional (29.3 p/kg) and organic (47.4 p/kg), a 0.01 kg/litre reduction saves 0.29 ppl in a conventional system but 0.47 ppl in an organic system, 62% more.

High milk from forage is not simply a cost-saving measure in organic, it is the mechanism by which it gains financial advantage.

The financial case for organic rests on three conditions being met simultaneously:

1. **The organic premium must exceed the additional feed costs at the farm's concentrate use rate.** At March 2025 prices, this required feeding below 0.54 kg/litre, tightening to 0.33 kg/litre on 3-year average milk and feed prices.
2. **Efficiencies in concentrate use must be achieved.** This is possible through investment in grazing infrastructure, sward quality and forage production.
3. **The organic premium must be sustained.** At 2025 prices, a 5 ppl fall in organic milk price would drop the breakeven from 0.54 to 0.27 kg/litre, a level very few farms achieve consistently.

A farm that meets all three conditions (a sufficient premium, disciplined concentrate use, and a sustained price gap) converts the higher cost of organic feed into a structural financial advantage rather than a burden.

Securing an organic contract in the UK is not guaranteed. Processors typically operate limited capped intake volumes, new entrants can face waiting lists, and the 2-year conversion period must be completed without organic premiums before any benefit from a higher organic milk price is realised.

Tackling the transition period

Moving to a low-input dairy system changes how the farm is managed, financed and staffed. Risk is highest before new skills, forage systems and cashflow buffers are in place, so planning actions, investment and risks stage-by-stage reduces exposure.

Transition typically moves through four stages (Figure 5), each with a different risk profile:

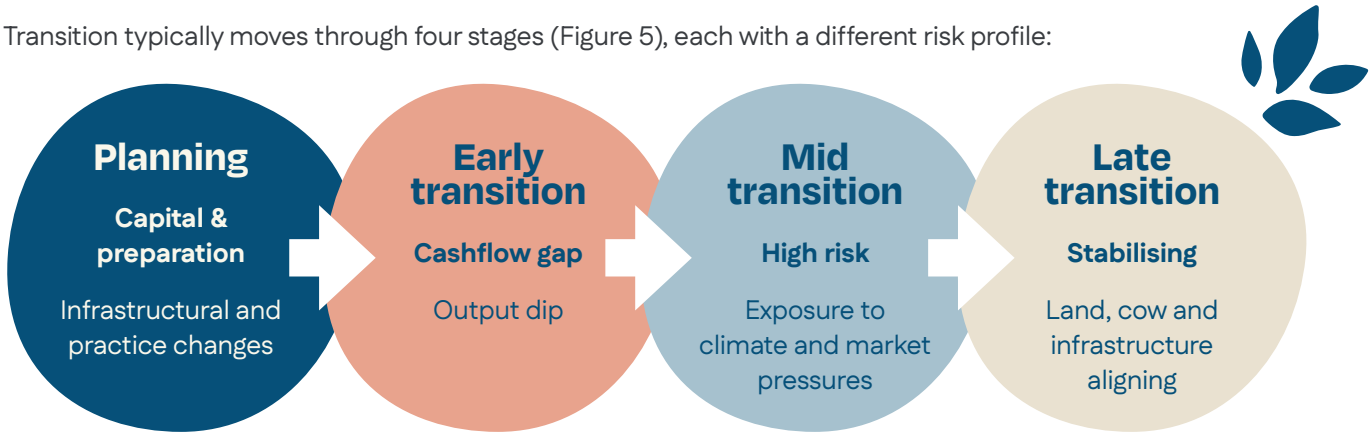


Figure 5

Understanding the actions associated with each transition stage (Table 15) helps model the pathway required, building resilience and protecting your farm through a volatile milk market.

Table 15: Low-input dairy transition actions by stage and theme

	Planning Capital & preparation	**Early transition** Cashflow gap	**Mid transition** High risk	**Late transition** Stabilising
Data, skills and labour *Grazing-led systems need more frequent and data-led decisions than systems reliant on purchased feed*	• **Assess labour** availability realistically, including time to build new skills	• **Allow time to trial** and adapt practices to suit the farm • **Track Key Performance Indicators (KPIs)** from the start	• **Make frequent grazing decisions;** use benchmarking to spot problems early	• **Keep benchmarking** to confirm the new skills and routines are working
Cashflow and markets *The financial case depends on a milk contract that rewards the system*	• **Test the contract:** assess the likelihood of a suitable one before committing • **Model the transition,** not just the target, across milk-price scenarios • **Arrange working capital** before the gap • **Identify funding:** agri-environment schemes, capital grants, private natural capital markets	• **Draw on working capital** to cover the cashflow gap • **Stagger spend** on reseeding, infrastructure and herd replacement rather than front-loading	• **Hold the line on staggered** spend and keep facilities available while exposure is highest	• **Review results** against the scenarios modelled at planning
Land, forage and livestock *Convert gradually to limit the risk of poor forage establishment*	• **Test soils and fix compaction** before investing in seed and fertiliser • **Plan breeding** around the cashflow and replacement capacity the farm can support	• **Build fertility gradually:** overseed and progressively reduce purchased fertiliser	• **Protect forage supply:** hold extra forage stocks or temporarily reduce stocking rate until new swards establish	• **Review alignment:** milk from forage, cow performance and infrastructure against original ambitions

It is crucial that KPIs such as milk from forage, concentrate feed rate and replacement rate are tracked from the beginning of transition. Benchmarking against similar farms can help identify emerging problems early.

The general principles associated with a low-input transition are to protect cashflow and productivity until the system is established, while securing the contract, funding the gap, staggering spend, and buffering forage through the high-risk mid-transition phase.

Putting low-input dairy into practice: key takeaways

Across the guide, the same levers appear repeatedly: producing more from forage, reducing exposure to purchased feed and fertiliser, using slurry and legumes more effectively, matching the cow to the system, and securing a market route that rewards the milk being produced. The detail will differ between farms, but these are the areas where transition costs, risks and opportunities need to be tested.

Key takeaways are:

- **Low-input transition is not simply about cutting inputs.** The aim is to redesign the system so that grass, forage, fertility, livestock and infrastructure work together with less reliance on purchased feed and fertiliser.
- **The economics depend on both cost reduction and market return.** Reducing concentrate, fertiliser, vet and medicine, herd replacement, bedding, machinery or labour costs can improve resilience, but the case is strongest where the milk contract also rewards the system being produced.
- **Low-input systems offer a steadier return.** *Low-input non-organic* outperformed the *base case* in every modelled market, and low-input organic did so in four of the five, with narrower swings than higher-output systems and less exposure to concentrate prices, although at the cost of a lower profit ceiling.
- **Forage performance is central.** Higher milk from forage reduces exposure to purchased feed costs, but it depends on sward quality, grazing infrastructure, silage management, soil fertility, cattle breed and day-to-day management.
- **Fertility has to match offtake, not simply be removed.** Reducing purchased fertiliser requires legumes, slurry and FYM to be used more effectively, alongside soil testing, nutrient planning and attention to pH, P, K, sulphur and soil structure.

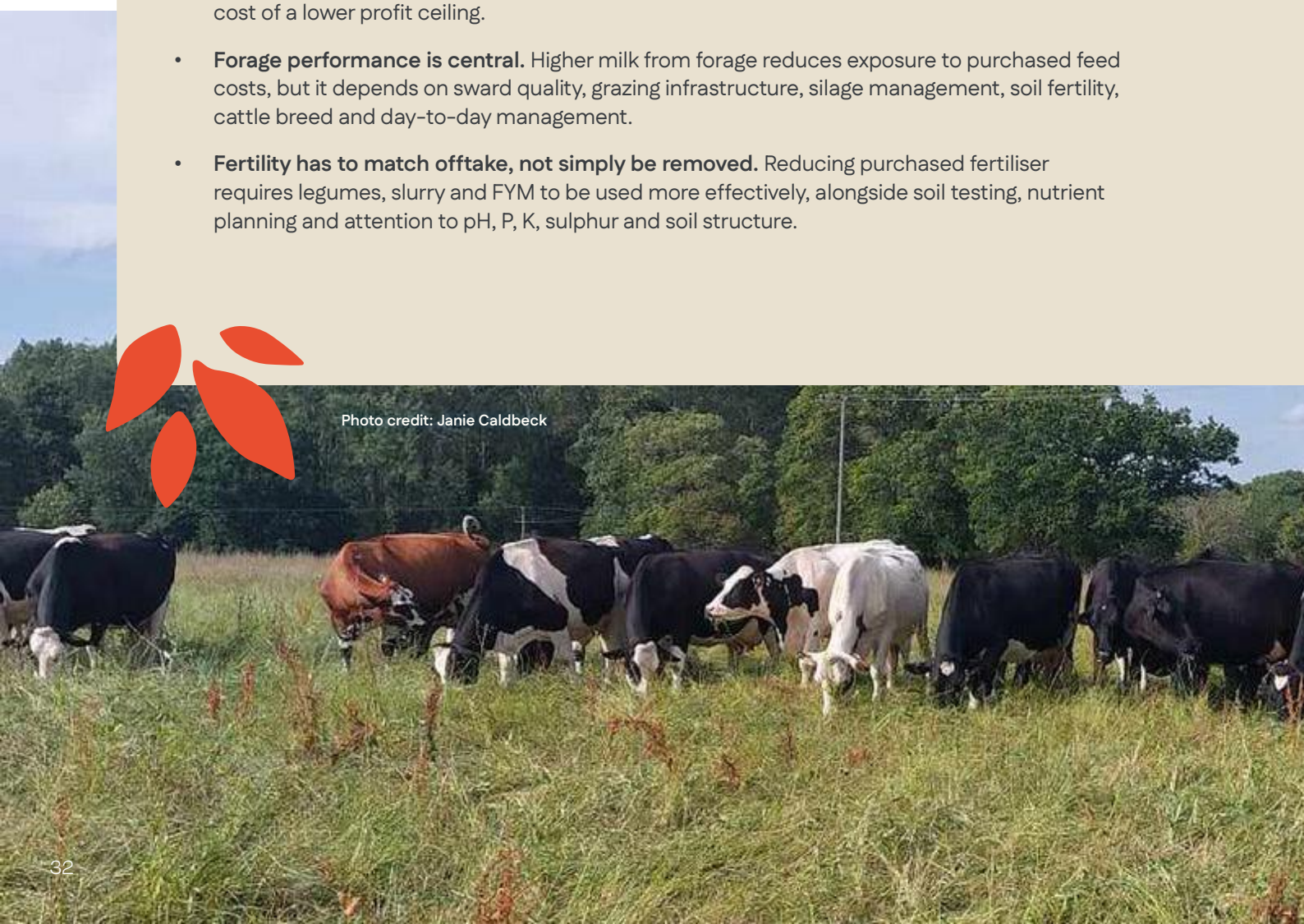
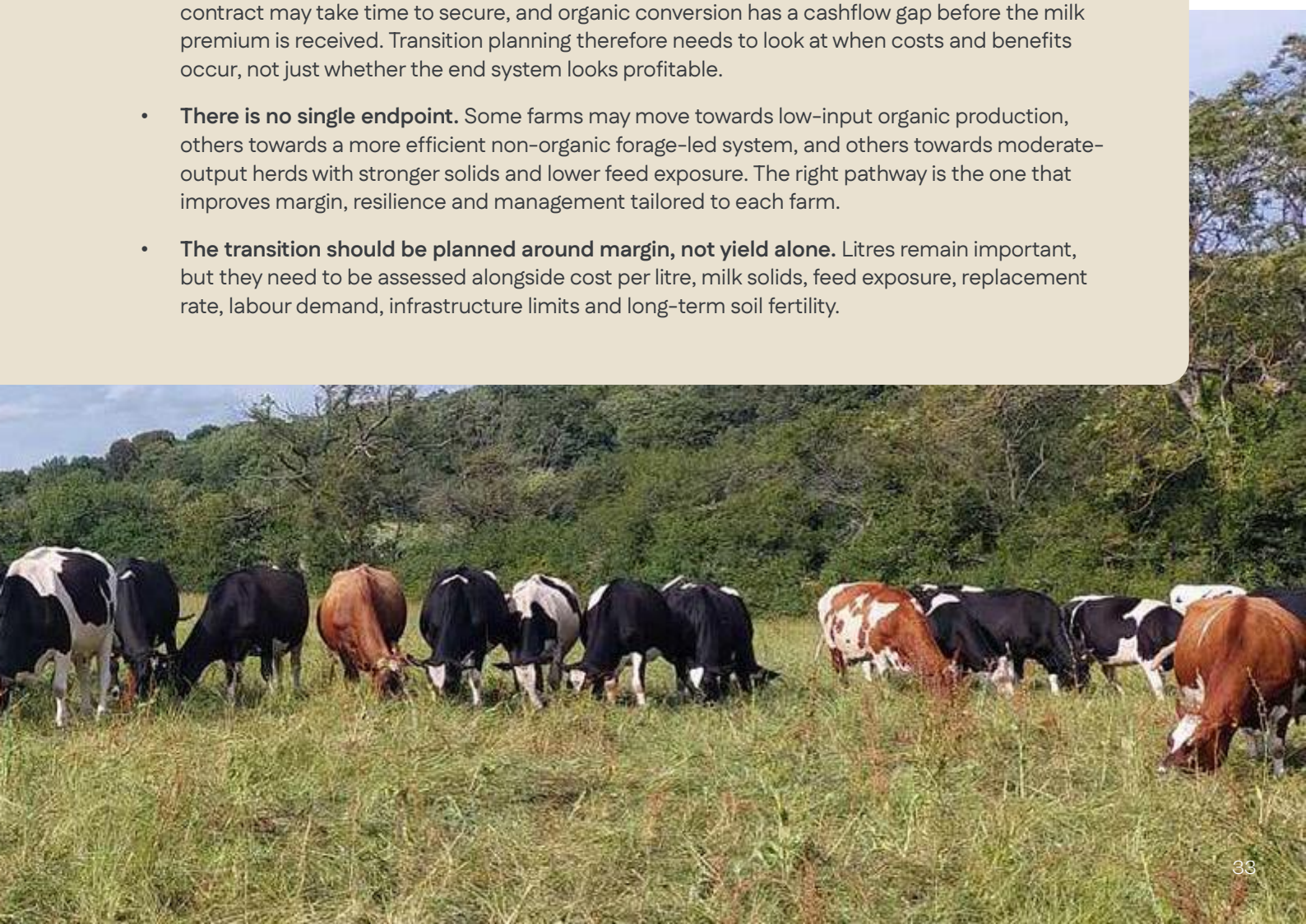


Photo credit: Janie Caldbeck



- **Herd genetics are a long-term constraint.** A herd suited to a high-output system will not fit a lower-concentrate, pasture-led or organic model without a clear breeding and replacement plan. Genetic change can take many years, so it needs to start early and be maintained consistently.
- **Investment needs to be targeted.** The guide identifies several possible costs — swards, grazing infrastructure, slurry equipment, advice, breeding and certification — but these should not be treated as a shopping list. The priority is to spend where it will remove a real constraint and improve the farm's ability to produce milk from its own forage and fertility base.
- **Timing matters as much as total cost.** Many transition costs arrive before the benefits are fully visible. Reseeding takes time to establish, breeding change can take years, an organic contract may take time to secure, and organic conversion has a cashflow gap before the milk premium is received. Transition planning therefore needs to look at when costs and benefits occur, not just whether the end system looks profitable.
- **There is no single endpoint.** Some farms may move towards low-input organic production, others towards a more efficient non-organic forage-led system, and others towards moderate-output herds with stronger solids and lower feed exposure. The right pathway is the one that improves margin, resilience and management tailored to each farm.
- **The transition should be planned around margin, not yield alone.** Litres remain important, but they need to be assessed alongside cost per litre, milk solids, feed exposure, replacement rate, labour demand, infrastructure limits and long-term soil fertility.



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Thanks

Our thanks to all those who contributed photos, time energy and knowledge in the creation of this guide. With special thanks to Rowan Dumper-Pollard and John Twyrford, but also to Julia Cooper, Kevin Lane, Clyde Jones, David Finley, Phil Sumption, Janie Caldbeck and Matt Smee. Thanks to Janie Caldbeck, Alice Farmery, Phil Sumption and Duncan Elliott for photos supplied.

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