

114. What are the main barriers that need to be overcome to drive the use and manufacture of fertilising products made from alternative biological sources of nutrients and processing technologies in the UK?

Our experience suggests that the main barriers are not primarily a lack of technical ideas, but a misalignment between regulation, market requirements and commercial viability. This is particularly clear for digestate-derived products. The consultation itself notes that there are currently no fertiliser-legislation requirements for novel fertilising products from digestate, compost, struvite, ammonia stripping and other nutrient-recovery routes, and that these products remain subject to other regimes such as waste and animal by-products regulation.

The first barrier is therefore **regulatory fragmentation and uncertainty**. A consistent finding from our digestate-related work was that the route from compliant digestate to a downstream fertilising product is often unclear, slow and commercially difficult to navigate. Achieving end-of-waste for digestate does not automatically confer end-of-waste or product status on new products made from that digestate. In practice, operators who want to convert a PAS 110 digestate into new fertiliser blends, concentrated nutrient products, refined liquids or horticultural ingredients may have to re-enter further regulatory processes, creating additional cost, delay and uncertainty. This creates an innovation penalty and discourages post-processing even where the technical route is promising.

The second barrier is **poor commercial fit between processing costs and downstream product value**. Many digestate-derived products make sense technically, but margins remain weak. Separation, drying, concentration, testing, certification, storage and marketing all add cost, while many downstream markets, including low-analysis fertilisers, soil improvers and horticultural ingredients, are relatively low-margin. Our work found that businesses can also become stuck in a period where capital is tied up in valorisation equipment while evidence for regulators is assembled and assessed, and potential routes to market are formalised, but the resulting product cannot yet be lawfully or confidently marketed.

The third barrier is **feedstock and process variability**. Alternative biological products are not uniform. In the digestate context, product quality depends heavily on feedstock mix, process design and operator know-how. The same product route may work well for a tightly controlled crop-fed or manure-fed system but not, for example, for commercial or retail food-waste streams. Several studies showed that achieving a stable, saleable product depends on tightly managed inputs, process discipline and routine monitoring rather than on equipment alone.

The fourth barrier is **market confidence**. Compliance alone does not create a market. Concerns about visible contamination, odour, herbicide residues, variable nutrient profile, storage behaviour and consistency were repeatedly noted as reasons why buyers remain cautious. Horticulture is the clearest example: even where the regulatory route has improved, users still require much more evidence on functional performance, crop safety, storage behaviour and supply-chain assurance than a simple nutrient declaration can provide.

A fifth barrier is **the absence of proportionate routes for small-scale and early-stage innovation**. Our work found that PAS 110 and associated compliance costs are often effectively unaffordable at micro-scale, and that mobile or shared systems run into additional site-specific traceability and product-status difficulties. This means the current system tends to favour larger, standardised operators over smaller and more decentralised innovation, even where the latter may better support local nutrient management and circular-economy goals.

Finally, there is a broader **policy imbalance**. Our work indicates that UK AD policy has historically supported energy generation more clearly than nutrient recycling or digestate product development. Government undertook an initial 2024 Call for Evidence on a future policy framework for biomethane production, and the GGSS has been extended to March 2028 partly to align better with the expected growth in food-waste feedstocks under Simpler Recycling. However, the fuller post-GGSS framework has still not emerged, leaving operators on earlier support schemes such as FIT, RO and RHI, and investors considering digestate valorisation, without the long-term certainty needed to commit capital at scale. This leaves the sector increasingly aware of the need for digestate product development, but without a sufficiently stable long-term policy framework to justify major downstream investment.

In summary, the main barriers are: a fragmented and uncertain route from waste-derived material to marketable product; the need to re-prove product status for downstream outputs; low margins relative to processing and compliance costs; variable feedstocks and product performance; contamination and market-confidence concerns; and the lack of a stable long-term policy framework that rewards nutrient recovery and higher-value processing.

115. What would be the benefits or drawbacks of expanding the scope of UK fertilisers legislation to fertilising products made from compost and digestate?

There could be significant potential benefits, provided that any expansion is **designed to complement rather than duplicate existing end-of-waste, certification and environmental-control regimes in a cost-effective manner**. This is particularly important because many compost- and digestate-derived products are relatively low-margin, so additional compliance burdens can quickly undermine commercial viability. The consultation notes that compost and digestate already sit within established waste/resource-framework and certification arrangements and explicitly asks about impacts on those existing frameworks and end markets.

The main benefit would be **a clearer and more investable route to market** for quality compost- and digestate-derived products, especially where these are no longer simply being spread to land but are being refined, blended or marketed as higher-value fertilising products. Our work found that many current barriers arise because product developers must move awkwardly between waste law, PAS/resource-framework routes, product standards, animal by-products rules and market-specific expectations. Bringing digestate- and compost-derived products more clearly into fertilisers legislation could reduce this fragmentation and give manufacturers, investors and buyers more confidence.

A second benefit would be **better recognition of nutrient recycling and circular-economy value**. The consultation itself points to nutrient recovery from digestate and waste as a route to support a more circular economy and refers to recommendations that products derived from quality recycled organic materials should be able to be classified as high-value products. Our experience supports this strongly: several digestate-derived routes are technically credible, including refined nitrogen products, fibre-based products and blended fertilising products, but remain disadvantaged by the lack of a clear and cost-effective product route.

A third benefit would be **better alignment with product development pathways in development**. Our work shows that digestate-derived materials increasingly include more than just whole digestate spread to land. They can include separated fibres, chars, nutrient concentrates, ammonium salts, pellets, organo-mineral products and blended products

destined for a variety of uses. A fertilisers framework that remains focused only on inorganic products and virgin materials risks overlooking the actual direction of travel in nutrient recovery and alternative processing.

A more proportionate approach may be to align end-of-waste assessment more closely with the requirements of the intended final market, especially where the product is being used within a tightly specified formulation and the final use conditions are well controlled.

This would not remove the need for contaminant limits, traceability or process controls, but it could avoid situations in which an intermediate digestate fraction is rejected even though the final product is tightly specified, quality assured and fit for purpose.

However, there are also drawbacks and risks. The first is **regulatory duplication**. If compost- and digestate-derived products are brought into fertilisers legislation without careful alignment to the Resource Framework, PAS 110, PAS 100, REAL-backed certification routes and other environmental controls, the result could be an additional layer of compliance and cost rather than a simplification. Our evidence suggests the sector needs a more coherent route with clearly defined regulatory costs and timescales, not simply another one.

The second risk is **forcing heterogeneous organic products into a model designed around uniform inorganic fertilisers**. Digestate-derived products do not all serve the same function. Some are used as bulk fertilisers or soil improvers; some are specialist horticultural ingredients; some are refined nutrient products; and some interact with animal by-products or bedding rules. In horticulture especially, fit-for-purpose and functional performance are more informative than simple comparison to a single conventional product type. If the legislation is expanded, it should not assume that all compost- and digestate-derived products can or should be regulated as if they are directly analogous to inorganic fertilisers.

The third drawback is that **fertilisers legislation alone will not solve all barriers**. For example, the use of dried AD fibre as cattle bedding is constrained primarily by APHA and assurance requirements rather than fertilisers law, and horticultural uses require further functional-performance and assurance evidence even after end-of-waste is established. Expanding fertilisers legislation would help some routes, but it would not remove all barriers to market development.

Overall, our experience suggests that expanding the scope of UK fertilisers legislation to include compost- and digestate-derived fertilising products could be beneficial if it creates a clearer, more proportionate and commercially intelligible route to market. The main benefit would be to support nutrient recycling and product innovation; the main risk would be duplication or poor fit with existing frameworks and with the distinctive characteristics of organic and recovered products.

116. Inorganic fertiliser products must comply with declared nutrient value limits as stated on each product's label. What evidence do you have that fertilising products containing organic nutrients can supply consistent levels of nutrients?

Our work suggests that this question should be approached carefully, because there is an important distinction between consistency of declared composition and predictability of agronomic performance in use. Organic and digestate-derived products can, in some cases, achieve sufficiently consistent declared nutrient contents for market use, particularly where

feedstocks are tightly controlled and processing is disciplined. However, they should not necessarily be assessed against exactly the same expectations as uniform inorganic fertilisers. The consultation itself notes that inorganic fertilisers are generally higher in nutrient concentration and easier to measure, store and spread, whereas organic materials are bulkier, more variable, and less predictable in nutrient release.

There is evidence that **products containing organic nutrients can achieve sufficiently consistent declared nutrient content** where feedstocks are tightly controlled, processing is disciplined and quality assurance is in place. This is particularly evident in crop-fed systems, but it can also apply to tightly managed manure- and waste-fed AD systems where inputs are well characterised and supported by routine testing, specification control and formal quality procedures.

However, consistency can be more difficult to demonstrate where feedstocks are inherently more variable or less tightly controlled, including some mixed waste streams and some food waste streams. In those cases, nutrient profile, ammonia, salts, contaminants and physical behaviour may vary more significantly, so consistency depends heavily on feedstock management, process control and product-specific development work. Not all digestates are the same.

A key point from our horticulture evidence is that **the relevant test is not always whether the product reproduces the nutrient profile or physical values of an inorganic or peat-based comparator, but whether it performs reliably and safely in its intended use while also offering other benefits both in agricultural and horticultural applications and to wider economic and social priorities**. In horticulture, for example, the sector often needs evidence on salinity, ammonia, storage behaviour, crop response, germination and functional performance rather than just a headline nutrient declaration. In that sense, specification-led and fit-for-purpose approaches may be more informative than expecting organic products to fit an inorganic-style nutrient model exactly.

Specifications are necessary, but for growing media and blended products they should be proportionate and functional. A manageable range in nutrient content is not necessarily a problem, provided it is understood through monitoring and can be accommodated by adjusting the final mix to achieve consistent performance. This also suggests the need to distinguish between safety-critical specifications, which should be controlled, and performance-related characteristics, which may be acceptable within a range if the material is well characterised, particularly where a final mix can be adjusted accordingly.

Our evidence also suggests that **greater consistency may be achievable in more refined organic products than in bulk digestate itself**. Several routes such as ammonium sulphate, ammonium nitrate-type products, nutrient concentrates, dried fractions and pelleted products, are essentially attempts to create more standardised, manageable and transportable nutrient products from digestate. However, these refined routes may then face other regulatory barriers, including end-of-waste uncertainty and, in some cases, PAS 110 methodologies that do not fit fractionated products well, such as where nitrogen has been removed for ammonium sulphate production, leaving the remainder with insufficient nitrogen for the product to adhere to nitrogen-based PAS 110 PTE limits.

In summary, the evidence from our work is that products containing organic nutrients can supply consistent levels of nutrients where feedstocks are controlled, processes are

standardised and the product is quality-assured. However, **consistency should not be judged solely by analogy with inorganic fertilisers**. For digestate- and compost-derived products, the more useful evidence base often includes batch-to-batch composition, contaminant control, nutrient availability and release profile, crop response and fitness for the intended end use. A future regulatory framework should therefore distinguish between declared composition and performance in use, rather than assuming that all products containing organic nutrients must conform to the same model as conventional mineral fertilisers.

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SHORTER ANSWERS

114. What are the main barriers that need to be overcome to drive the use and manufacture of fertilising products made from alternative biological sources of nutrients and processing technologies in the UK?

Our experience suggests that the principal barriers are regulatory uncertainty, weak commercial incentives and limited market confidence, rather than a lack of technical concepts.

First, the route from compliant digestate to a downstream fertilising product is often unclear and commercially difficult to navigate. Achieving end-of-waste for digestate does not automatically confer product status on further processed outputs, so operators wishing to produce refined liquids, blends, pellets or nutrient concentrates may face additional regulatory steps, cost and delay. This creates a disincentive to innovate and an “innovation penalty” for early adopters.

Second, many digestate-derived products are commercially challenging because processing, testing, certification, storage and marketing costs are high relative to the value of downstream markets. Even where a product is technically promising, margins may be too low to justify investment.

Third, feedstock and process variability remain significant barriers. Alternative biological materials are not uniform, and product quality depends heavily on feedstock provenance, process control and operational discipline. This makes standardisation more difficult than for conventional inorganic fertilisers.

Fourth, market confidence is a major constraint. Buyers remain concerned about contamination, odour, variability, herbicide residues, storage behaviour and performance in use. In horticulture especially, acceptance depends on much more than nutrient content alone.

Finally, there is a broader policy gap. Our work indicates that policy support has historically been clearer for AD energy generation than for nutrient recycling or digestate product development. Additionally, the lack of a long-term AD framework undermines investor confidence. That weakens the investment case for more advanced processing and market development.

In summary, the main barriers are: fragmented and uncertain regulatory routes; the need to re-prove product status for downstream outputs; low margins relative to compliance and processing costs; feedstock and product variability; contamination and market-confidence concerns; and insufficient long-term policy support for nutrient recovery.

115. What would be the benefits or drawbacks of expanding the scope of UK fertilisers legislation to fertilising products made from compost and digestate?

There would be clear potential benefits, provided that any reform is designed to align with existing end-of-waste, certification and environmental-control regimes rather than duplicating them.

The main benefit would be a clearer and more investable route to market for compost- and digestate-derived fertilising products, especially where these are refined, blended or marketed as higher-value products rather than simply applied to land. Our experience indicates that current regulatory fragmentation is a major barrier to innovation and commercialisation.

A second benefit would be better recognition of nutrient recycling and circular-economy value. Digestate- and compost-derived products can contribute to nutrient recovery, resilience and reduced reliance on imported mineral fertilisers, but current routes do not consistently support that transition.

A third benefit would be improved alignment between legislation and the actual direction of product development. Our studies show that digestate-derived outputs increasingly include separated fibres, refined nutrient products, concentrates, pellets and blended products, which do not fit neatly within a framework focused primarily on conventional inorganic fertilisers.

However, there are also important risks. The first is regulatory duplication. If compost- and digestate-derived products are brought into fertilisers legislation without careful alignment to existing PAS, Resource Framework and certification routes, the result could be additional complexity rather than simplification.

The second is poor regulatory fit. Organic and recovered products are heterogeneous and do not always lend themselves to the same assumptions as uniform inorganic fertilisers. In horticulture especially, functionality and fitness for purpose may be more informative than simple equivalence to conventional fertiliser types.

Overall, our experience supports expansion in principle, but only if the framework is proportionate, coherent and designed around the actual characteristics of compost- and digestate-derived products rather than simply extending an inorganic-fertiliser model to them.

116. Inorganic fertiliser products must comply with declared nutrient value limits as stated on each product's label. What evidence do you have that fertilising products containing organic nutrients can supply consistent levels of nutrients?

Our work suggests that this question should distinguish between consistency of declared composition and predictability of agronomic performance in use.

There is evidence that products containing organic nutrients can achieve sufficiently consistent declared nutrient contents where feedstocks are tightly controlled, processing is disciplined and quality assurance is in place. This is particularly evident in crop-fed systems, but it can also apply to tightly managed manure- and waste-fed AD systems where inputs are well characterised and supported by routine testing, specification control and formal quality procedures.

However, consistency can be more difficult to demonstrate where feedstocks are inherently more variable or less tightly controlled, including some mixed waste streams and some source-segregated food waste streams. In those cases, nutrient profile, ammonia, salts, contaminants and physical behaviour may vary more significantly, so consistency depends heavily on feedstock management, process control and product-specific development work.

Our experience also indicates that nutrient consistency alone is not always the most informative measure for organic and digestate-derived products. For many such products, particularly in horticulture, the more relevant evidence includes batch-to-batch composition, contaminant control, nutrient availability and release profile, crop response, storage behaviour and overall fitness for the intended end use.

In addition, more refined products derived from digestate, such as ammonium sulphate, nutrient concentrates, dried fractions or pelleted products, may offer greater consistency than

bulk digestate itself. These routes are intended in part to create more standardised and manageable nutrient products, although they may then face other regulatory barriers.

In summary, the evidence from our work is that products containing organic nutrients can supply sufficiently consistent nutrient levels in some contexts, particularly where feedstocks and processes are tightly controlled. However, such products should not always be assessed solely by analogy with inorganic fertilisers. A future regulatory framework should recognise both declared composition and performance in use and should allow evidence of consistency to be demonstrated in ways that are appropriate to organic and recovered nutrient products.