

Alternative crop factsheet: Mushrooms

OPPORTUNITIES FOR MUSHROOM PRODUCTION

Historically mushrooms have largely been produced in Ireland, the Netherlands, France and Belgium, creating a high level of competition of UK production with imports.

However, post-Brexit trade arrangements challenging the status quo of current food supply chains arrangements around Europe may have an impact on the feasibility of mushroom imports. While 90% of Ireland's mushrooms are sold to the UK, with little opportunity to diversify export markets due to short shelf life, and strong relationships with UK retailers, impacts on cross-border trade such as non-tariff barriers may affect the feasibility of this relationship long term, and create more opportunity for a domestic market.

Shifting consumer trends, such as interest in healthy eating, plant-based diets, vitamin availability of foods, locally-produced and low-carbon foods, as well as for vegetables sold loose/by weight rather than packaged in plastic also indicates strong future growth for mushroom markets. Mushrooms can be enriched with vitamins B12 and D, and Scotland provides a comparable growing environment to Ireland.

Furthermore, while common mushrooms (*Agaricus bisporus*) are the most widely produced mushrooms in Europe, flat/portobello mushrooms, and other exotic and higher value mushrooms may have greater added value providing sufficient markets and outlets. There is currently no reported commercial speciality mushroom production in Ireland or the UK (Mycelia), although speciality mushrooms account for around 3.5% of the European market.

Currently UK mushroom producers are either "highly efficient enterprises with strong links to supermarkets, or small low-cost family-run enterprises selling largely to wholesalers". (Nix, 2017). Production of mushrooms is scientific, specialized, and centralized within the UK, with the main challenge for new producers being establishment of new facilities and a position in the marketplace. Initial market outlets tend to be wholesale, and once quality and volume of crops is more consistent and sufficient, supermarket and direct sales may have more potential, particularly in a cooperative of growers. AHDB's Mushroom Grower Group, formed in 2019, offers support and advice for mushroom growers.

GROSS MARGIN

These gross margins are based on use of phase 2 compost, assuming an average of 6.5 crops of mushrooms per year.

Data source: Nix Pocketbook , 2017

	/tonne compost
Yield (t)	0.25
Price per tonne	£ 1,850
Spent compost	£ 2.10
Output	£ 464.6
<i>Compost</i>	£ 96
<i>Casing</i>	£ 16
<i>Growing labour</i>	£ 17
<i>Picking labour</i>	£ 123
<i>Packing materials</i>	£ 55
<i>Packing labour</i>	£ 28
<i>Energy costs</i>	£ 28
<i>Other costs</i>	£ 38
Variable costs	£ 401
Gross margin (per t compost)	£ 63.6

Establishment costs:

- Buildings – the cost of this is dependent on many factors, including size of operation, conversion of existing building or building new units etc. For a commercial scale operation Nix estimate that 8 rooms each of 200 m2 are required, at an establishment cost of £200-300k.



CROP ESTABLISHMENT AND PRODUCTION

LAND REQUIREMENTS

Most mushroom production is done indoors, which allows for much closer controlling of the environment, as well as a degree of 'vertical' production (i.e. layers of production trays). The cost of establishing buildings for a commercial scale operation is estimated at around £200,000-300,000.

CLIMATE

For commercial production a controlled environment is needed, allowing for control of temperature, moisture, CO₂ levels, composition and biology of the substrate, water and light.

SOIL TYPE

As well as the right environmental conditions, the right nutritional conditions are essential for mushroom cultivation. This might include horse and chicken manure, straw and gypsum and precise composting procedures, and there are several stages of controlled composting to create the right conditions and biological balance; specialist advice is required if making this on-farm, or it is possible to buy in prepared compost.

INPUTS

In addition to specialist compost and tunnels/sheds, sterilised grain kernels coated in fungal culture can be bought to establish mushrooms. Alternatively, compost can be bought pre-populated with spores.

MACHINERY AND EQUIPMENT

The cost of establishing composting equipment was estimated at £250,000 around 20 years ago, and advised only for larger scale developments.

Other equipment includes a hopper to transfer the compost from the lorry to sheds, shelving and beds, and machinery to fill the shelving with compost.

*The most produced mushroom species in the world is *Agaricus bisporus*, the common mushroom. Production of other types of mushroom might create opportunity to add value, such as shiitake, oyster and portobello.*

PROCESSING AND SUPPLY CHAINS

- Mushroom production requires considerable capital outlay, primarily on the cost of building indoor facilities, whether through conversion of existing farm buildings, or establishment of new specialist buildings.
- Harvesting the crop is labour intensive as it is done by hand, and labour requirements should be considered along the same lines as other indoor horticulture systems, estimated at around 45% of the total variable costs.
- Packing facilities are required on or near farms, with greater overheads the smaller the operation. Sorting of mushrooms for quality and packaging is also a labour intensive process.
- Mushrooms have a very short shelf life so local and well-connection market outlets must be considered, as well as logistics of harvesting, packaging and distribution.
- In Ireland 80% of mushroom producers are in producer organisations (set up through an EU scheme), allowing them to work together to optimise production costs, stabilise prices and strengthen their position in the market place.

Further information

- John Nix Pocketbook, 2017
- SAC Technical Note: Advice to prospective mushroom growers. Available online.
- Red Tractor Crop Modules.
- Vegetable Production and Practices, by Gregory E. Welbaum

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