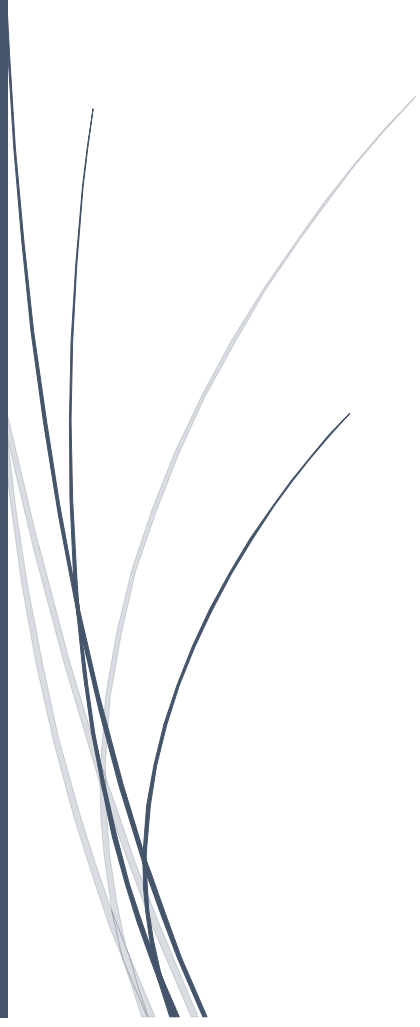
Benefits of Oats & Barley

The use of them to increase the fibre content as part of a health daily diet



BOBMA

The British Oat and Barley Millers' Association

Background

From its survey with Censuswide, the Food and Drink Federation (FDF) found that only one in three (33%) consumers are aware of the recommended adult dietary fibre intake of 30g per day and 70% were unsure as to whether they achieve this in their diet or stated they don't meet the daily recommendation. This aligns with dietary survey data which shows that only 9% of adults currently meet the dietary recommendation. Therefore, as part of its annual, Celebrating Food and Nutrition Week, FDF launched an initiative in 2021 – Action on Fibre – to help bridge the gap between fibre intakes and dietary recommendations.

Cereal grains constitute a significant part of the daily diet of consumers and can contribute to about 50% of the total dietary fibre intake in Western Countries. Whole grain oats and barley in particular are popular grains and have many similarities in looks, taste and nutritional value[1]. As an FDF association, British Oats and Barley Millers Association (BOBMA) has created the following information paper to highlight how oats and barley can be used, as part of a healthy diet, to increase the fibre content and their health benefits.

What is dietary fibre[2]

Dietary fibre is an essential part of the human diet and refers to a complex group of substances in plant materials which cannot be completely broken down by human digestive enzymes. Therefore, it passes through to the colon. While some types of fibre can be fermented by gut bacteria and contribute positively to the gut microflora, other less fermentable fibre can help with bowel movement and prevent constipation. There is also significant amount of evidence which suggests that diets rich in fibre, particularly cereal fibre and wholegrains, can be beneficial in lowering the risks of many health conditions, including diabetes (type 2), cardiovascular disease, and colorectal cancer.

Dietary fibre can be classified according to its water solubility: as insoluble dietary fibre (IDF) and soluble dietary fibre (SDF) [3,4]:

- IDF includes cellulose, water-insoluble hemicellulose and lignin, and are mainly present in plants as structural cell wall components[3,4].
- SDF consists of a variety of non-cellulosic polysaccharides and oligosaccharides. Examples are pectins, β-glucans and water-soluble gums[3,4].

SDF and IDF differ largely in their functionality as food ingredients and their physiological effects upon consumption[4].

Barley and oats are excellent sources of both SDF and IDF. SDF (mainly β-glucan) is located in the endosperm cell walls, while the outer layers, the seed coat and the pericarp contribute significantly to the insoluble dietary fibre content of the grain (cellulose, Arabinoxylan (AX) and lignin)[3,4].

Oats

The most common cultivated oat species is white oat (*Avena sativa* L.)[4]. Oats are very nutrient dense food; naturally a very high source of fibre, monounsaturated fatty acids, a rich source of vitamins and minerals (thiamine, biotin manganese, phosphorus, copper, magnesium, and a recognised source of iron, potassium, zinc and folate), a source of protein, as well as antioxidants and phytochemicals. The antioxidants are concentrated in the outer layer of the kernel in the bran fraction of the oat grain, for this reason the whole grain provides more nutritional benefits than the refined grain[4].

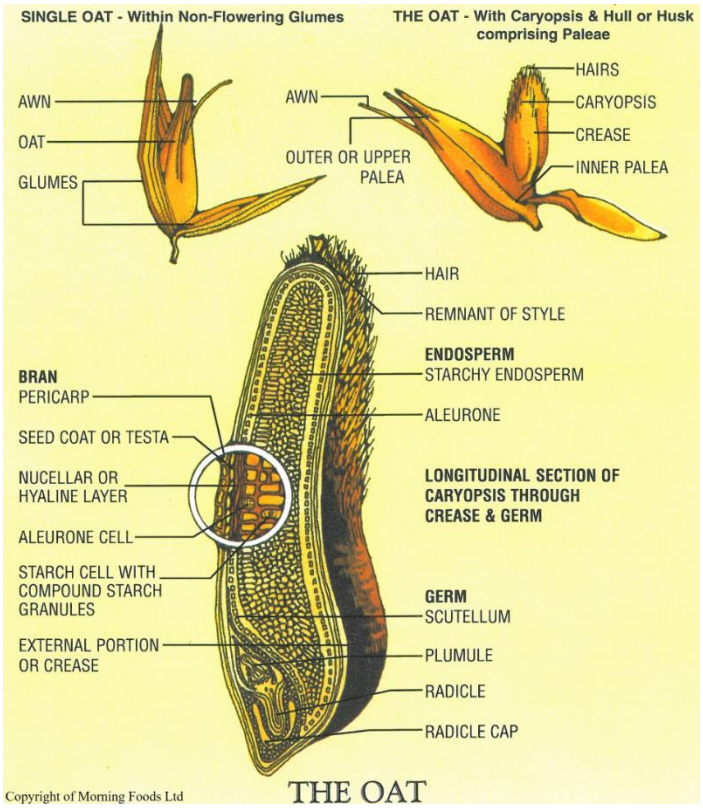


Image: Courtesy of Morning Foods Ltd.

Types of Oats[5]

- **Oat Groats**: Cleaned whole oat kernels, with only the hulls removed. Groats contain the intact germ, endosperm, and bran. Oat bran contains the most fibre in a groat, is also removed and eaten as a cereal or added to recipes to boost fibre content. Suitable for the production of savoury products such as Haggis, black pudding and sausages, soups, breads…etc. where groats can provide texture.

- **Steel-Cut or Irish**: Oat groats cut into two or three smaller pieces using a steel blade.

- **Oatmeal**: Oat groats stone-ground into a meal.

- **Rolled or Old-Fashioned**: Oat groats that have been steamed, cut, rolled and flattened into flakes, and then dried to remove moisture which makes them more shelf stable. Suitable for the production of porridge, cheesecake bases, muesli and cereal bars, flapjacks, cakes, biscuits, bread coatings…etc.

- **Quick or Instant:** Oat groats that are steamed for a longer period, then cut and rolled into thinner pieces so that they can absorb water easily and cook very quickly.

- **Oat Flour**: Oat flour is a whole grain flour that can be used in snacks, bakery products such as biscuits, breads, cakes, or for thickening soups and stews.

- **Oat bran:** Oat bran is the outer casing of an oat grain and is obtained by grinding clean oat groats and removing the oat flour.

Barley

Barley (*Hordeum vulgare L. ssp. vulgare*), is one of the earliest cultivated cereals and exists in hulled and hull-less varieties. It also shares the same richness in minerals and vitamins as oats and is packed with antioxidants [6,7,8].

Types of Barley[7,9]

- **Hulled barley**: The whole-grain version of barley with only the outer, inedible hull removed.
- **Pearl barley**: Partially steamed barley with its hull and bran removed. If it's lightly pearled, pearl barley will be tan coloured; if it's heavily pearled, barley will be white. Can be used in soups, stews and risotto.
- **Barley flakes**: Barley flakes are steamed, rolled and flattened, similar to rolled oats. Generally used for the production of muesli, breakfast cereals or can be added to bread. Can also be available as flavoured flakes where an additional coating of spice flavours or fruit powders has been added.
- **Barley grits**: Toasted and cracked barley. Barley kernels are cut into several pieces. They vary in nutrient content depending on their source (hulled or pearled barley).
- **Barley Flour**: Barley flour is used in baked goods and as a thickener for soups, stews and gravies.
- **Quick Pearl Barley** (not a whole grain): partially cooked and dried during the flake-rolling process. Although barley flakes can be whole grain (similar to quick oats), the quick barley commercially available is made from pearl barley (not whole grain).

Health benefits

Both barley and oats contain *β*-glucan as the primary non-starch polysaccharide in the whole kernel. AX is also found in both cereals, but in a much lesser content. *β*-glucan and AX are typically present as 70 to 20% of the total dietary fibre content in these cereals[7]. Whole grain barley can provide similar amounts of *β*-glucan as oats do, which allows the same health benefits and fibre contribution to digestive health.

The consumption of oats, barley and their products has been linked to numerous positive health benefits. The EFSA approved health claims are listed in Regulation (EU) No 432/2012, under Article 13(1) for general function and under Article 14(1) for reduction of disease risk and are presented below in **Table 1[10,11].** For further information on health and nutritional benefits of Oats please refer to the Oat Dossier by Croucher, D; Meyer, J C (October 2022).

Oats and Barley in product innovations

Although whole grain oats and barley are mostly used to produce breakfast cereals and related products, they can also be used as a wheat alternative in a range of food products. Products such as oat rice and oat noodles/pasta that are eligible to carry beta glucan cholesterol-lowering health claims provide an opportunity to extend the use of oats and barley in products to assist in achieving the efficacious dose of beta glucan more regularly[6]. Product innovation should therefore consider use of minimally processed whole grain oats and barley to maintain the food matrix and maximise the health benefits[6].

BOBMA Recipe Recommendations and Ingredients

- **Hamlyn's** - Oat Crumbed Smoked Haddock Fishcakes
- John Hogarth Ltd
- **Morning foods** - Gingerbread Waffles
- Navara Oat Milling
- Richardson Milling
- Scott's Porage
- **Silvery Tweed** – Barley Porridge
- **Quaker Oats** – Meatloaf
- **White's Speedicook** - Mexican Black_Bean Oat Burgers

Claim type	Nutrient substance, food or food category	Claim	Conditions of use of the claim / Restrictions of use / Reasons for non-authorisation	Health relationship	EFSA opinion reference	Commission Regulation
Art.13(1)	Oat grain fibre	Oat grain fibre contributes to an increase in faecal bulk	The claim may be used only for food which is high in that fibre as referred to in the claim HIGH FIBRE as listed in the Annex to Regulation (EC) No 1924/2006.	Increase in faecal bulk	2011;9(6):2249	Commission Regulation (EU) 432/2012 of 16/05/2012
Art.13(1)	Barley grain fibre	Barley grain fibre contributes to an increase in faecal bulk	The claim may be used only for food which is high in that fibre as referred to in the claim HIGH FIBRE as listed in the Annex to Regulation (EC) No 1924/2006.	Increase in faecal bulk	2011;9(6):2249	Commission Regulation (EU) 432/2012 of 16/05/2012
Art.14(1)(a)	Oat beta-glucan	Oat beta-glucan has been shown to lower/reduce blood cholesterol. High cholesterol is a risk factor in the development of coronary heart disease	Information shall be given to the consumer that the beneficial effect is obtained with a daily intake of 3 g of oat beta-glucan. The claim can be used for foods which provide at least 1g of oat beta glucan per quantified portion.		Q-2008-681	Commission Regulation (EU) 1160/2011 of 14/11/2011
Art.13(1)	Beta-glucans	Beta-glucans contribute to the maintenance of normal blood cholesterol levels	The claim may be used only for food which contains at least 1 g of beta-glucans from oats, oat bran, barley, barley bran, or from mixtures of these sources per quantified portion. In order to bear the claim information shall be given to the consumer that the beneficial effect is obtained with a daily intake of 3 g of beta-glucans from oats, oat bran, barley, barley bran, or from mixtures of these beta-glucans.	Maintenance of normal blood cholesterol concentrations	2009;7(9):1254	Commission Regulation (EU) 432/2012 of 16/05/2012

Art.13(1)	Beta-glucans from oats and barley	Consumption of beta-glucans from oats or barley as part of a meal contributes to the reduction of the blood glucose rise after that meal	The claim may be used only for food which contains at least 4 g of beta-glucans from oats or barley for each 30 g of available carbohydrates in a quantified portion as part of the meal. In order to bear the claim information shall be given to the consumer that the beneficial effect is obtained by consuming the beta-glucans from oats or barley as part of the meal.	Reduction of post-prandial glycaemic responses	2011;9(6):2207	Commission Regulation (EU) 432/2012 of 16/05/2012
Art.14(1)(a)	Barley beta-glucans	Barley beta-glucans has been shown to lower/reduce blood cholesterol. High cholesterol is a risk factor in the development of coronary heart disease	Information shall be given to the consumer that the beneficial effect is obtained with daily intake of 3 g of barley beta-glucan. The claim can be used for foods which provide at least 1 g of barley beta-glucan per quantified portion.		Q-2011-00799	Commission Regulation (EU) 1048/2012 of 08/11/2012
Art.14(1)(a)	Barley beta-glucans	Barley beta-glucans has been shown to lower/reduce blood cholesterol. High cholesterol is a risk factor in the development of coronary heart disease.	Information shall be given to the consumer that the beneficial effect is obtained with a daily intake of 3 g of barley beta-glucan. The claim can be used for foods which provide at least 1 g of barley beta-glucan per quantified portion.		Q-2011-00798	Commission Regulation (EU) 1048/2012 of 08/11/2012

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