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## **Agrifoods**

A brief overview of the UK agrifood patent landscape



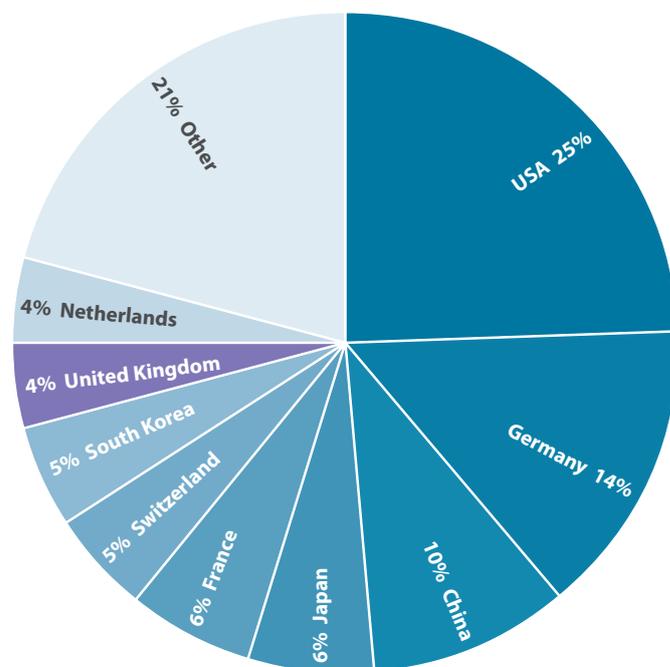


# Agrifoods

Agrifood includes agriculture, horticulture and food and drink processing technologies<sup>1</sup>. In consultation with expert patent examiners at the Intellectual Property Office, it was decided that relevant patents relating to the agrifood sector could be found within four classes of the International Patent Classification (IPC)<sup>2</sup> and European patent classification (ECLA)<sup>3</sup>. These are:

- A01 (agriculture; forestry; animal husbandry)
  - Class A01 includes patents relating to, amongst others, soil working, fertilising, harvesting, cultivation, manufacture of dairy products, apiculture, and pesticides.
- A21 (baking; edible doughs)
  - Class A21 includes patents relating to, amongst others, bakers' oven machines and equipment, and the treatment and preservation of bakery products.
- A22 (butchering; meat treatment; processing poultry or fish)
  - Class A22 includes patents relating to, amongst others, slaughtering and the processing of meat, poultry and fish.
- A23 (foods or foodstuffs; their treatment)
  - Class A23 includes patents relating to, amongst others, preserving, edible oils of fats, coffee and tea, cocoa products, confectionery, fodder, protein compositions, and the shaping and working of foodstuffs.

There are over 3.6m published patents in the agrifood sector worldwide (approx. 5% of all patents). Figure 1 shows the applicant country distribution for all agrifood patents. The most prolific country is the USA, with a quarter of all agrifood patents coming from US applicants. German applicants are second with 14%, followed by Chinese applicants with 10%. These top three applicant countries account for almost half (49%) of all agrifood patents. UK applicants are ranked 8th and account for 4.2% of all worldwide agrifood published patents.



**Figure 1:** Applicant country distribution for agrifood patents

1 [http://www.innovateuk.org/\\_assets/pdf/Corporate-Publications/BioSciencesTechnologyStrategyFinal.pdf](http://www.innovateuk.org/_assets/pdf/Corporate-Publications/BioSciencesTechnologyStrategyFinal.pdf) (page 21)

2 Specific IPC terminology can be viewed online at <http://www.wipo.int/ipcpub/#refresh=page>

3 Specific ECLA terminology can be viewed online at [http://v3.espacenet.com/eclasrch?locale=en\\_V3&classification=ecla](http://v3.espacenet.com/eclasrch?locale=en_V3&classification=ecla)

However, it is well known that there is a greater propensity to patent in certain countries than others (in particular, American and Japanese inventors are prolific patentees across most technology areas), and the distribution shown in Figure 1 may change if the figures are corrected for this difference in behaviour. Therefore, the Relative Specialisation Index (RSI) for each applicant country has been calculated to give an indication of the level of patenting in the agrifood sector for each country compared to the overall level of patenting in that country, and this is shown in Figure 2.

RSI is a correction to absolute numbers of patents in order to account for the fact that some countries file more patent applications than others in all fields of technology. This RSI compares the fraction of agrifood patents from each applicant country to the fraction of total patents from each applicant country and applies a logarithm to scale the fractions more suitably.

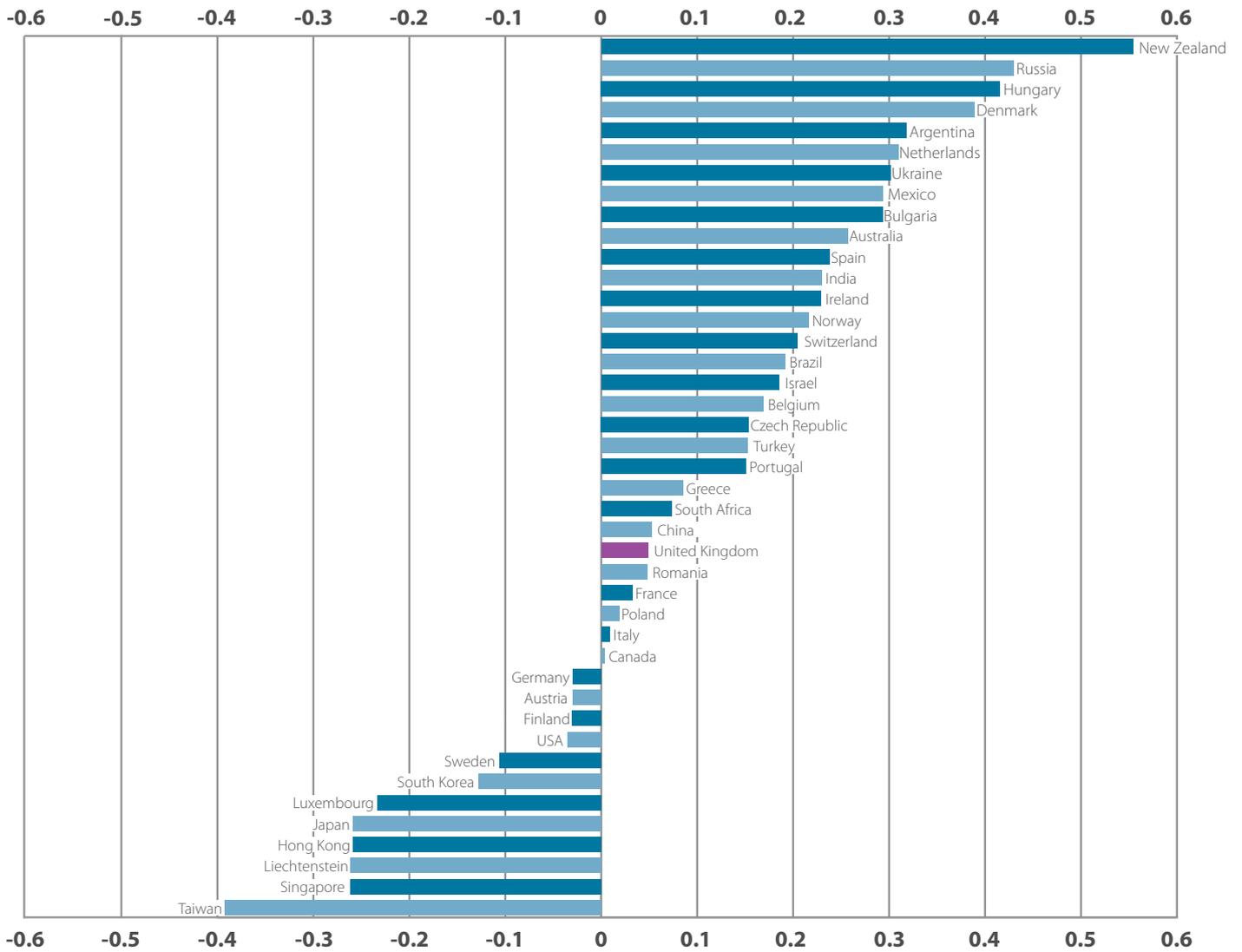
The formula is given below:

$$\log_{10} \left( \frac{n_i/n_{total}}{N_i/N_{total}} \right)$$

where  $n_i$  = number of agrifood patents in country  $i$ ;  $n_{total}$  = total number of agrifood patents in dataset;  $N_i$  = total number of patents in country  $i$ ; and  $N_{total}$  = total number of patents in dataset.

The effect of this is to highlight countries which have a greater level of agrifood patenting than expected given their overall level of patenting and which would otherwise languish, unnoticed, much further down in the applicant country distribution shown in Figure 1.





**Figure 2:** Relative Specialisation Index (RSI) by applicant country for agrifood patents



The RSI chart in Figure 2 suggests a very different picture to that shown in Figure 1. The USA, Germany, China and Japan are the top four applicant countries in Figure 1 and appear relatively specialised in the agrifood sector, but this is now reversed when the RSI is applied with the USA, Germany and Japan all having negative RSI values which shows that in reality applicants from these countries file fewer agrifood patents than would be expected given their overall levels of patenting.

Applicants with the highest RSI score come from New Zealand, Russia, Hungary, Denmark and Argentina; these high-ranking countries, especially New Zealand, show much greater levels of patenting in agrifoods than expected given their modest absolute levels of patenting. However, perhaps given the importance of farming to the New Zealand economy and the other countries ranked near the top of Figure 2, this data is not

that surprising. This is also true when analysing the small Far Eastern countries, such as Taiwan, Singapore and Hong Kong, which have negative RSI scores and are ranked at the bottom of the RSI chart because these countries are dominated by urban areas with heavy industry and have small farming sectors.

Agrifood patents from UK applicants are around the level expected given the overall level of patenting from UK applicants, with the UK having a mildly positive RSI score of 0.05. However, Figure 2 shows that the UK is ranked 25th worldwide, suggesting that it lags behind a number of countries from all six major continents.

The applicant country RSI scores for the agrifood sector suggests that the UK is not a world-leading innovator and is some way behind a number of both developed and developing nations.





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