

Status of the tallow (animal fat) market

2013 Update

- Input to PIR -



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1 Introduction

In 2012 the Department for Transport (DfT) asked Ecofys to produce a report on the animal fat (tallow¹) market, to assess whether there has been any impact from allowing double counting of biodiesel produced from Category 1 tallow, as input to the December 2012 DfT stakeholder consultation on the Year 6 RTFO Guidance. That report concluded that, based on the available data, double counting of Category 1 tallow biodiesel was not having a detrimental effect on the volumes of UK Category 3 tallow produced.

DfT intends to continue to monitor the volumes of Category 3 tallow produced in the UK, and reported under the RTFO. This report therefore serves as an update to the original report, and will additionally be used as an input to the 2013 RTFO Post-implementation review.

1.1 Double counting in the RTFO

Article 21(2) of the EU Renewable Energy Directive (RED) allows Member States to count biofuels produced from wastes, residues, non-food cellulosic material, and ligno-cellulosic material twice towards their 10% renewable energy in transport target for 2020. Member States have the responsibility to decide which feedstocks should count twice towards their target.

To give stakeholders certainty on which feedstocks can be counted twice, DfT defines a positive list of feedstocks that can be classed as wastes and residues under the RTFO.

DfT's definition of wastes and residues leads to the conclusion that biodiesel from Category 1 tallow (see Box 1 for definitions) should be double counted, but biodiesel from Categories 2 and 3 should not. Therefore from the date of UK RED implementation (15 December 2011), Category 1 tallow biodiesel has been eligible for double counting, but Categories 2 and 3 (or unknown categories) of tallow biodiesel have not. This decision was also taken in light of concerns raised by stakeholders that some categories of tallow have existing uses other than biodiesel production which would be displaced if the tallow is diverted to biodiesel production. Note that tallow of unknown category (for example if it is imported from a country that does not use this categorisation) is automatically single counted.

Further to the DfT positive list, the European Commission proposal on addressing indirect land use change (iLUC), published on 17 October 2012, proposes to allow biofuel from Category 1 and 2 tallow to be counted twice towards the target. Category 3 would be single counted.

¹ The term 'tallow' can be strictly interpreted to mean animal fat from cows, however in this report we use the term to describe animal fats more broadly (i.e. including pigs, poultry, sheep and goats).

Box 1: Definition of categories of tallow²

Tallow is a product of the meat rendering process. Tallow is classified by degree of quality, from high to low:

- Animal fats intended for human consumption.
- Category 3: Tallow that can be used for animal feed, cosmetics and petfood. For example parts of slaughtered animals, which are fit for human consumption in accordance with EU legislation, but are not intended for human consumption for commercial reasons.
- Category 2: Tallow that can be used for soil enhancement and for technical purposes, such as oleochemical products and special chemicals (after appropriate treatment). Examples of this Category include manure and digestive tract content, (parts of) animals that have died from other causes than by being slaughtered for human consumption, including animals killed to eradicate an epizootic disease³;
- Category 1: Tallow that presents a high risk for human health, for example animals suspected of being infected by a TSE⁴ or in which the presence of a TSE has been officially confirmed; specified risk material. Tallow in this category can be used for energy purposes and is not allowed to enter the human or animal food chains.

When products of different categories are mixed, the entire mix is classified according to the lowest category in the mix (e.g. if Category 1 and 3 tallow are mixed then this is classified as Category 1). It is not possible for Category 1 tallow to ever be reclassified as Category 3 tallow.

1.2 Aim of this report

DfT wishes to monitor any impact on the tallow market caused by allowing double counting only for Category 1 tallow biodiesel. A key risk identified by some stakeholders is that volumes of Category 3 tallow produced may decrease if it is no longer worth the cost for renderers to separate out Category 3 from Category 1 tallow. This report aims to update the 2012 review of the UK tallow market and inform DfT on any changes or trends. The report will additionally be used as an input to the 2013 RTFO Post-implementation review.

² <https://www.gov.uk/dealing-with-animal-by-products>

³ Disease affecting many animals of the same species that spreads quickly within a particular geographical area, for example foot and mouth disease.

⁴ Transmissible Spongiform Encephalopathy, group of diseases affecting the brain and nervous systems of animals.

2 Tallow biodiesel use

2.1 Data reported under the RTFO

Figure 1 shows total tallow biodiesel (tallow methyl ester – TME) volumes reported since the start of the RTFO. From Year 4 economic operators have been asked to report the category of tallow that the biodiesel was made from, before this no data is available on the split. Overall tallow biodiesel volumes have fluctuated significantly, with particularly low volumes reported in Year 4 when the duty differential was in place for biodiesel from used cooking oil (UCO).

The data reported shows a significant increase in overall tallow biodiesel volumes in Year 5 compared to Year 4, although volumes are still lower overall than Years 1 and 2 (Figure 1). Especially noticeable is that 95% of the (low volume) of tallow biodiesel reported in Year 4 was from Category 3, whereas 99% of the tallow biodiesel reported in Year 5 is from Category 1.

In Year 5, 80 million litres biodiesel from Category 1 tallow were reported to DfT all from European sources (with only 0.1% of unknown country of origin). UK sourced tallow represents the largest share (38%)⁵. Only 0.5 million litres biodiesel from Category 3 tallow were reported in Year 5, all from the UK. This contrasts with the early years of the RTFO, particularly Years 1 and 2, when imports from the US dominated (the respective shares in Years 1 and 2 were 83% and 51% of the total volumes, dropping off to 10% in Year 3). Our understanding is that the decreased supply from the US is a direct result of the anti-dumping and anti-subsidy regulations imposed by the EU on the US in July 2009⁶.

⁵ Largest contributions in millions of litres from the UK (30.3), Republic of Ireland (12.7), Germany (10.7), Netherlands (8.8) and Denmark (5.7), followed by (in order of largest contribution) Austria, Belgium, France, Switzerland, Italy, Belarus, Spain, Slovakia, Czech Republic, Unknown, Slovenia and Poland.

⁶ These regulations were put in place for a period of five years and are therefore due to expire in July 2014.

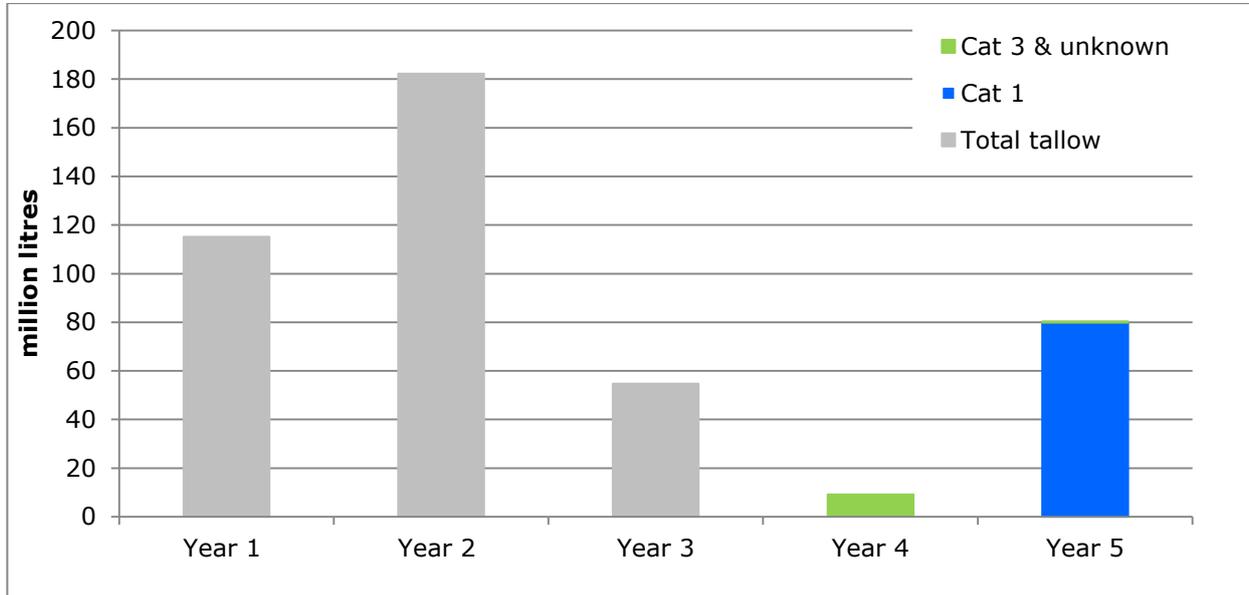


Figure 1: Total tallow biodiesel volume reported under the RTFO in million litres. Source: DfT RTFO Biofuel Statistics

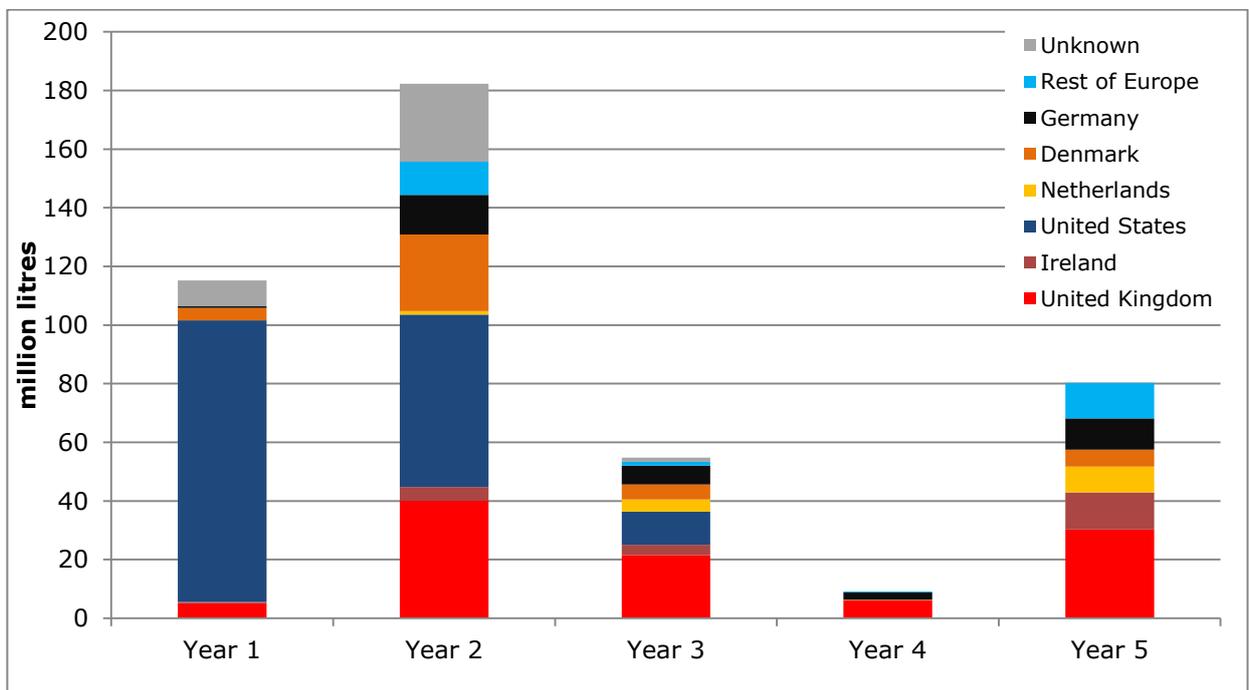


Figure 2: Total tallow biodiesel volume reported by country/region under the RTFO in million litres. Source: DfT RTFO Biofuel Statistics

2.2 European biodiesel production using tallow

Data from EFPR, the European Rendering Association, shows the total volume of tallow biodiesel produced in Europe (21 Member States) to have increased by around 75% between 2010 and 2012 (see Figure 3).

A key trend observed over this period is that the use of Category 1 and 2 tallow for biodiesel production has increased threefold, from just under 160 million litres biodiesel (140kt) in 2010 to just under 500 million litres (435kt) in 2012⁷. Category 3 tallow biodiesel production increased marginally between 2010 and 2011, but decreased in 2012 by around 45 million litres (40kt) to 250 million litres (225kt). Category 1 tallow biodiesel now represents around two thirds of the total, compared to only one third in 2010.

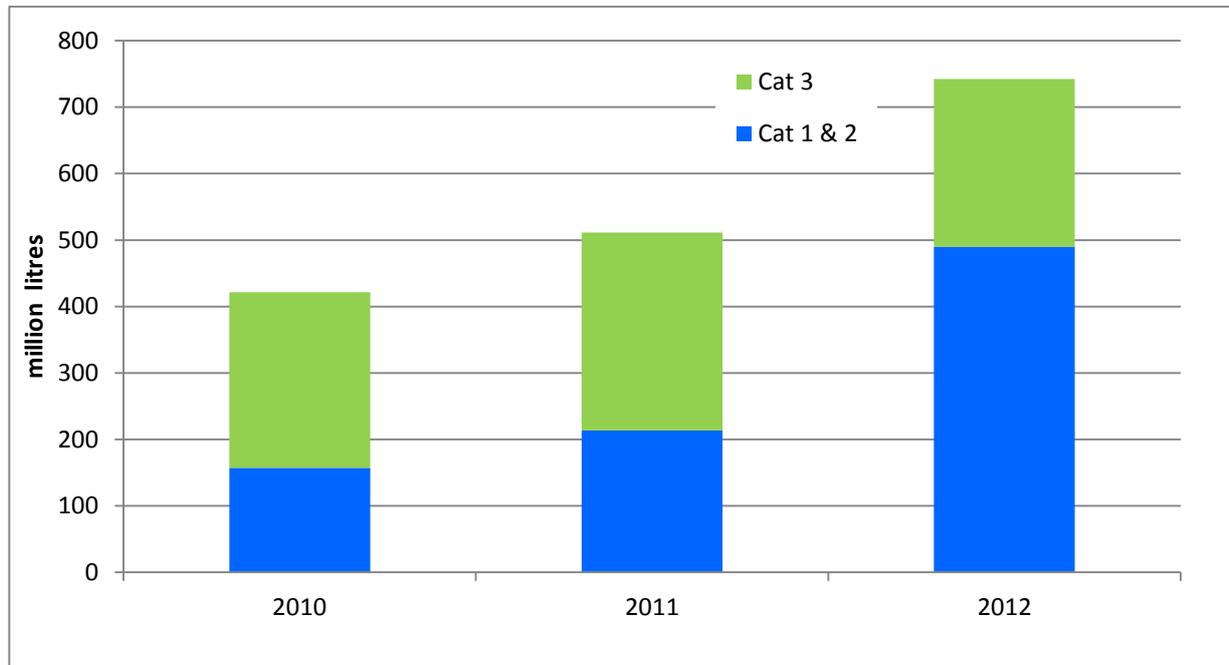


Figure 3: European biodiesel production using tallow by category. Source: based on EFPR data, converted using FAME density of 0.89kg/l (BioGrace)

⁷ Note that EFPR estimate that around 80% of the total is Category 1 tallow.

3 Tallow production and market developments

3.1 UK tallow production

UK production data for tallow is prepared by the two UK rendering associations (FABRA and UKRA) on a calendar year basis, and is based on submissions from the rendering companies. The latest data available therefore relates to 2012. Data for 2013 will be available in spring 2014.

Figure 4 shows UK tallow production since 2008. Overall there is a slight (but not significant) downward trend in total tallow production from 2008 to 2012. Notably, Category 3 tallow production is markedly above Category 1 tallow production in both 2011 and 2012. Data for these years shows that approximately two thirds of tallow production in the UK was Category 3, and the remaining third was Category 1. There are currently no known rendering plants in the UK capable of producing Category 2.

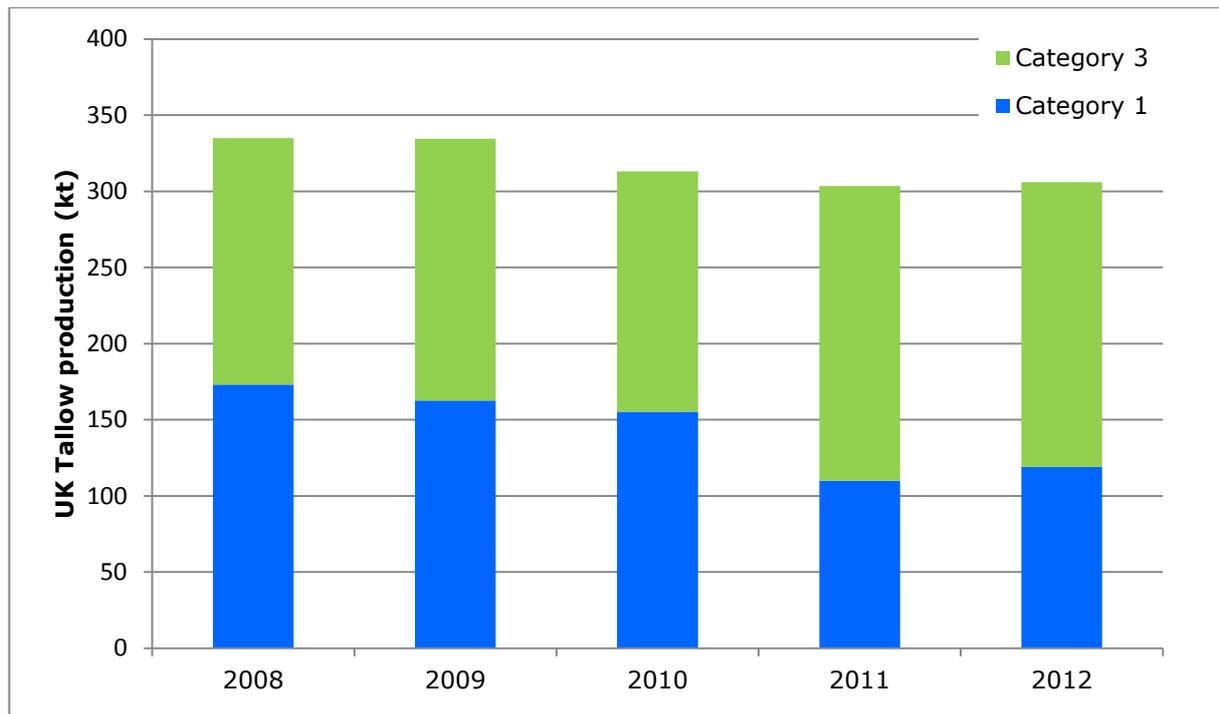


Figure 4: UK tallow production by category. Source: FABRA (personal communication, 2013)

Category 3 tallow was used for biodiesel production in the UK in 2011. However, direct communication with FABRA and UKRA suggests that Category 3 tallow is no longer being used for biodiesel production in the UK following the decision to introduce the double counting incentive only

for Category 1 and the higher relative price of Category 3 (see below). Our discussions with a selection of UK biofuel industry stakeholders support this view.

Furthermore, Category 1 tallow can only be used in biodiesel plants and supply chains that are licensed by Defra to handle the material, which has meant that some of the biodiesel producers that were using Category 3 tallow in the UK have not been able to directly switch to using Category 1. In addition, Category 1 has a relatively high Free Fatty Acid (FFA) content and this limits its use from a technical perspective to those biofuel plants that have undergone specific investment to be able to process the material. Based on these considerations, our understanding is that Category 1 tallow is currently only being processed in the UK by Argent Energy.

According to the two UK rendering associations the majority of Category 1 tallow is used within the UK, both for biodiesel production and for the industry's own use as a process fuel. As well as tallow, renderers can also use heavy fuel oil and natural gas as an alternative, and switch between fuels depending on the relative economics. It is reported that the use of tallow as a process fuel has declined this year due to the lower price of natural gas, making more tallow available for biodiesel production. (Renderers in France and Germany have also been reportedly switching from tallow to gas in recent years.)

As well as tallow, renderers produce protein (meals) in a relationship of around 2 to 1 (i.e. 2 tonnes of protein for every tonne of tallow). The main markets for Category 3 protein in the UK are as ingredients in pet food, animal feed and fertiliser manufacture. Category 1 protein cannot be used in these markets.

3.2 European raw material volumes

Data for the total volume of animal by-product (ABP) material processed in 2012 in Europe (21 countries) was obtained from EFRA (see Figure 5). It is evident that the shares of the categories of ABP material processed vary widely between countries. However, in almost all countries (and particularly the main ABP processing countries such as France, Germany, Spain and Italy) and across Europe as a whole the share of Category 3 material produced is significantly greater than Category 1 material. Furthermore, Category 2 material either makes up only a small share of the total volume or in some countries (like the UK) none at all.

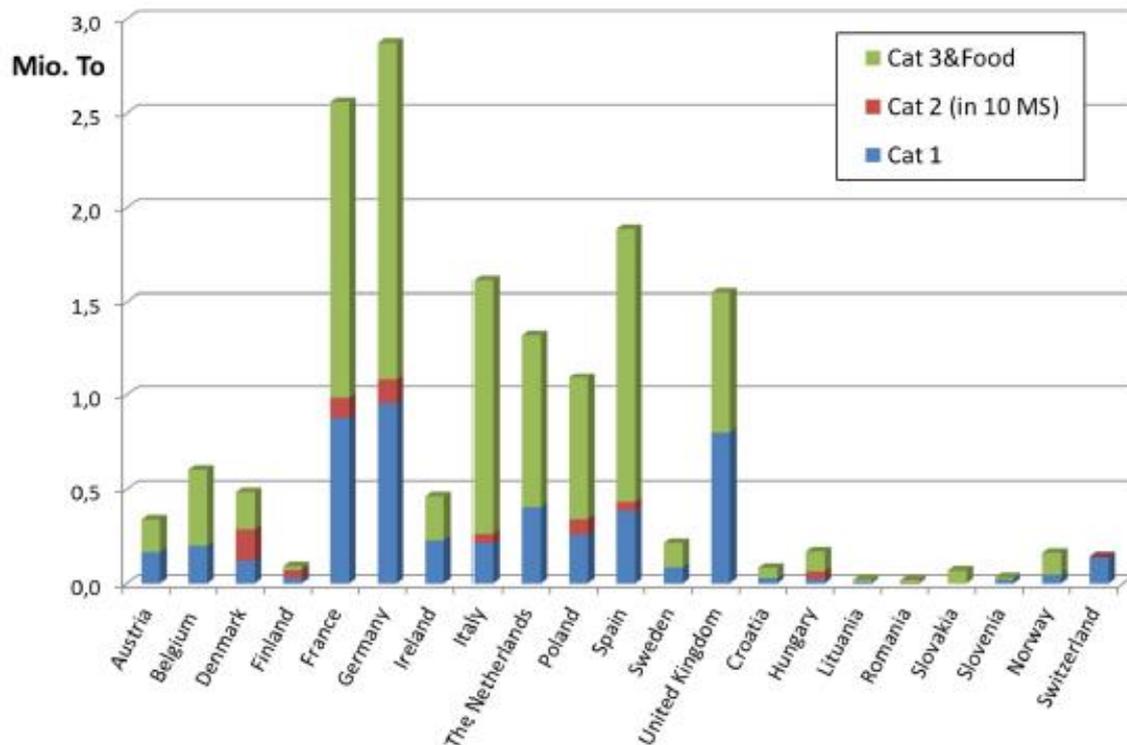


Figure 5: European ABP production by category in 2012. Note that ABP volumes refer to the 'raw material' volumes, including fat and protein, and are reported on a wet basis (UK data is consistent with the data in Figure 4 reported by FABRA.) Source: EFPRA

3.3 Updates to Animal By-product Regulations

Use of Processed Animal Proteins in aqua feed

As of 1 June 2013 the regulations surrounding use of processed animal proteins (PAPs) as an ingredient in aqua feed for farmed fish were relaxed⁸. PAPs derived from animals that were fit for human consumption at the point of slaughter (Category 3) from non-ruminant sources can now be used within the EU. PAPs derived from ruminant sources (e.g. cows) are still prohibited.

The impact of this policy change is likely to be an increase in the demand for Category 3 protein in this high value market.

Relaxing import of Category 1 tallow for biodiesel production

Discussions are underway at the EU level to relax the requirements for importing high risk (Category 1 equivalent) tallow for biodiesel production to the EU. In the EU, Category 1 material needs to

⁸ The use of PAPs in all farmed animal diets, including those of fish, was banned in the EU in 2001 following animal health protection measures against TSE.

undergo stringent pre-processing, involving high temperature and pressure using live steam (so called Method 1 treatment). The proposed amendment would permit the use of Method 7 treatment, which is commonly used for Category 3 material in the EU. If these proposals are implemented it would open up key markets such as the US, which are currently restricted from exporting high risk tallow since the processing method used to treat it is not consistent with Method 1.

The impact of the change might be to enable imports of third country tallow for use in biodiesel production.

Relaxing of export of pet food products from UK

EU regulations currently prohibit the export of Category 3 processed protein for use in pet food from the EU unless a formal agreement is in place that the receiving country will only use the protein for uses not banned in the EU. Until recently the agreement had to be between the Member State and the receiving country. A recent change in legislation means that agreements can now be made between the EU as a whole and the receiving country. No EU-wide agreements have yet been formalised but, once they are, they should give greater access to this high value market to UK producers.

Following recent legislative changes processed petfood can now be exported to non-EU countries with the need for a bilateral agreement. However, there is still a need for an export health certificate. Defra has established a task force to assist UK companies by identifying and fast-tracking the production of export health certificates for countries where potential exports are hampered by the lack of the certificate.

The effect of this initiative could be to increase demand for Category 3 material for pet food.

4 Tallow prices

The prices of both Category 3 tallow and CPO are seen to fluctuate on a quarterly basis. Figure 6 shows market price data available to DfT for Category 3 tallow and crude palm oil (CPO) (a potential substitute for tallow). DfT does not currently have access to price data for Category 1 tallow.

In general the prices of the two feedstocks have followed similar movement trends. The price for both feedstocks increased sharply during 2010, with CPO peaking at around €870/t in Q1 2011 and Category 3 tallow peaking at around €810/t in Q3 2011. CPO prices thereafter varied across a range of around €720-800/t for CPO and €670-810/t for Category 3 tallow for the remainder of 2011 and part of 2012. Prices for both feedstocks thereafter decreased significantly; CPO fell €173/t between Q4 and Q3 2012, while tallow dropped €168/t between Q4 2012 and Q1 2013. Pricing for both feedstocks have now returned to levels similar to Q1 2010, with Category 3 tallow trading at around €561/t and CPO marginally higher at €578/t.

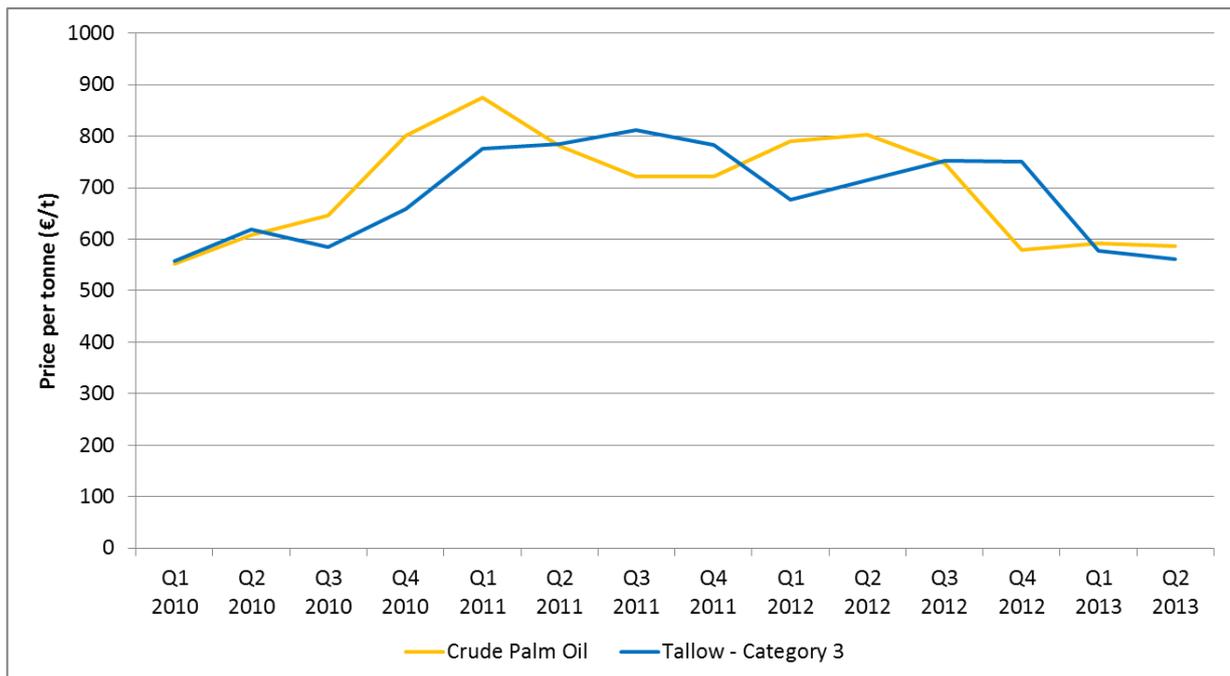


Figure 6: Quarterly average prices per tonne for Category 3 tallow and crude palm oil (€/t). Source: DfT.

Note that the crude palm oil prices have been converted from Malaysian Ringgit (MYR) to Euros using quarterly exchange rate data from XE.com (<http://www.xe.com/currencycharts/?from=MYR&to=EUR&view=5Y>).

No market data for Category 1 tallow could be obtained, however our understanding is that Category 1 tallow has been trading in the range £420-450 (€355-380) in the UK during 2013, and consistently trades below the price of Category 3 tallow. Similarly, Category 3 meal trades at a significant mark-

up to Category 1 meal. Category 3 meal trades at several hundred pounds, while Category 1 meal would typically only earn around £50/t (absolute maximum of £100/t).

A trader we interviewed indicated that double counting in the UK and elsewhere is an important factor in driving up the price of Category 1 tallow, and expects the price to rise further still in the future. According to the trader the price of UCO is also an important factor. Currently UCO trades at a premium of around €250 per tonne more than Category 1 tallow, and in the trader's view this price differential is not justified based on the relative qualities of the two feedstocks.

The overall impression is that the higher price that can be achieved for, especially high end, Category 3 tallow and protein means that tallow renderers continue to choose to segregate products at the abattoir. For existing rendering plants that already have the equipment in place to segregate products, there is little additional cost to continue to segregate products.

5 Observations and Conclusions

Based on the above, we conclude the following:

- RTFO data reported shows tallow biodiesel volumes have fluctuated significantly, with particularly low volumes reported in Year 4 (when the duty differential was in place for UCO).
- There has been a shift away from Category 3 to Category 1 tallow biodiesel from Year 4 to Year 5, with double counting introduced for Category 1 towards the end of Year 4. In Year 4, 95% of the (overall low volume of) tallow biodiesel reported was from Category 3, while 99% of the tallow biodiesel reported in Year 5 was Category 1. It should be noted, however that data on the split between Category 1 and 3 biodiesel is not available for Years 1-3 of the RTFO.
- Tallow biodiesel imports from the US dominated supply in Years 1 and 2 of the RTFO (comprising 83% and 51% of the total volumes respectively). Since Year 4 all tallow biodiesel has been of European origin. In Year 5 the UK represents the largest source of tallow (38%), with the next greatest share arising from Ireland (16%).
- Category 1 tallow can only be used in licensed biodiesel plants, which has meant that anecdotally some of the biodiesel producers that were using Category 3 tallow in the UK have not switched to using Category 1 tallow.
- Overall there is a slight (but not significant) downward trend in UK tallow production from 2008 to 2012. Of note, however, is that between 2008 and 2010 Category 1 and 3 tallow was produced in similar volumes, while in 2011 and 2012 the share of Category 3 tallow produced actually increased to above 60%. This supports the view that slaughterhouses and renderers are currently looking to better segregate material to benefit from selling to high-value markets (such as pet food, animal feed and oleochemicals). Across Europe as a whole the share of Category 3 material produced is significantly greater than Category 1 material.
- A significant pricing differential exists between Category 1 and 3 tallow and meal.

Overall the currently available data suggests that double counting of Category 1 tallow biodiesel has increased the ratio of Category 1 biodiesel reported as compared to Category 3 biodiesel, although noting that that data on the split between Category 1 and 3 biodiesel is not available for years 1-3 of the RTFO. However the data so far does not support the hypothesis that double counting is having a detrimental effect on the volumes of UK Category 3 tallow produced. In total, volumes of tallow biodiesel are significantly higher than in Year 4 (when the duty differential was in place for the competing biodiesel feedstock UCO), but volumes are not higher than in Years 1 or 2.

6 Experts who provided input

We are grateful to the following stakeholders who provided input and insights in the preparation of this report.

1. Floris Ebeli, Demeter (tallow trading company based in the Netherlands)
2. David Green, UKRA (UK Renderers' Association)
3. Dirk Dobbelaere, EFRA (European Renderers' Association)
4. Patrick Lynch, Greenergy
5. Klaus Nottinger, APAG (European Oleochemicals and Allied Products Group)
6. Dickon Posnett, Argent Energy
7. John Reid, BACS (British Association for Chemical Specialities)
8. Steve Woodgate, FABRA (Foodchain and Biomass Renewables Association)

Appendix A: Tallow countries of origin

Table 1: Countries of origin for tallow reported under the RTFO in million litres. Source: DfT RTFO Biofuel Statistics

Country of origin	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12		Year 5 2012-13	
				Cat 1	Cat 3 & unknown	Cat 1	Cat 3 & unknown
Austria						3.50	
Belarus						0.43	
Belgium		0.03	0.24			2.86	
Canada		6.50	0.05				
Czech Republic						0.13	
Denmark	4.27	26.18	5.04			5.74	
Finland		0.23	0.56				
France		1.56	0.12			2.80	
Germany	0.55	13.56	6.52			10.74	
Ireland	0.40	4.71	3.52	0.13		12.66	
Italy		0.46				0.64	
Lithuania			0.17				
Netherlands		1.12	4.15			8.76	
Poland		1.80	0.09			0.03	
Slovakia						0.23	
Slovenia						0.07	
Spain						0.25	
Switzerland		0.72				1.15	
United Kingdom	5.16	40.03	21.56	0.29	5.78	29.81	0.49
United States	96.07	58.85	11.31				
Unknown	8.74	26.55	1.43			0.10	
Total	115.19	182.31	54.76	0.42	8.76	79.89	0.49

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