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INTERESTERIFICATION IN OIL PROCESSING

W Hamm
Harpenden, Herts, AL5 2NZ, UK
E-mail: whamm@btconnect.com

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The place of interesterification in oil processing

The three modification processes used by the edible oils and fats industry – hydrogenation, fractionation and interesterification – have enabled the industry in the 20th century to extend the range of fat-based products by manipulating the properties of oils and fats on a vast scale, and this has played no small part in the expansion of the industry in the century recently consigned to history. Interesterification is the ‘youngest’ of these oil modification processes, having been introduced in the USA in the 1940s. By then hydrogenation had already been in use in the oils and fats industry for about 40 years, and fractionation on a pre-industrial scale dates back at least to the middle of the nineteenth century.

In the first half of the twentieth century, animal fats were an important constituent of the US edible fats profile, with lard being used extensively in a range of applications. In the 1940s, if not earlier, it became clear that lard could only remain competitive with other fats if its crystallisation characteristics could be modified. Research in the 1940s led to the commercialisation of interesterification during the 1950s. In a paper published in 1956 Hawley and Holman (1) reported that they had overcome the graininess problem in natural lard by random interesterification, but went on to point out that in order to produce a shortening from natural lard which was free of graininess and at the same time had the plastic range desirable in a shortening they had to use directed rather than random interesterification. However, directed interesterification is a more expensive process to operate than random interesterification and has in practice been eclipsed by random interesterification.

By an irony of history industrial application of interesterification took place when production of soyabeans began its steep climb, which provided the US oils and fats industry with substantial supplies of an oil that proved extremely versatile. As a result, the need for interesterification declined. It was also a time when cottonseed oil production was on the wane due to the growth of the synthetic fibre industry. These developments soon led to reductions in the share of the US edible fats market for lard and cottonseed oil.

In the USA interesterification is now virtually restricted to providing improved melting characteristics for speciality fats. However, the interest in restricting the trans-fatty acid content of edible fats may lead US processors to return to interesterification.

The use of the process in Europe, where formulation of blends relies to a considerable degree on substitutability and least-cost formulation is an important concept, is far greater than its use in North America. Europe has also taken a lead in the use of interesterification as a way of minimising the TFA (trans-fatty acids) content in consumer products.

The use of enzymes has brought a new dimension to the study of interesterification, with both the technology and applications of this development attracting much attention, although the cost of enzyme replacement makes this a costly process to apply, at least at present.

The papers being presented at this meeting will be covering the whole spectrum of interest in the subject of interesterification.

Reference

1. Hawley, KH and Holman, GW. *J Amer Oil Chem Soc*, 33(1): 29–35 (1956)