Methodology

Determining wax in sunflowerseed oil

The problem of determining wax in sunflowerseed oil has been an industry concern for some time. In crude sunflowerseed oils, the wax concentration can range from 0.02 to 0.3%. After dewaxing, the remaining wax is usually in the range of 0–150 ppm. The determination of waxes in the dewaxed oil is difficult, not only because of the relatively low level of wax remaining (which may require a considerable amount of time to crystallize), but also because wax crystallization can be inhibited by trace impurities in the oil, especially phosphatides.

Because of these factors, the present AOCS Cold Test Method Cc 11-53 (73) can give misleading results when applied to sunflowerseed oil. The method also is time-consuming and not really suited to process control. Other methods, based on gas liquid chromatography and gravimetric procedures, have been used and are reasonably accurate, but these methods also are time-consuming.

To overcome the problems associated with the AOCS Cold Test Method, Brimberg and Wretensjo (*JAOCS* 56:857 [1979]) developed a rapid method based on turbidity measurements. The turbidity measurements technique required approximately 10 minutes. This method was suitable for partially refined sunflowerseed oil, but it could not be applied to crude oils due to the inhibition of wax crystallization caused by impurities in the oil.

In 1982, Morrison (*JAOCS* 59:284) reported on a modification of the method of Brimberg and Wretensjo. Morrison's method also was turbidimetric, but used a 50:50 mixture of acetone and oil. After the mixture was placed in an ice bath, the turbidimetric measurement was completed within five minutes. This modification permitted application of the method to crude and processed sunflowerseed oil.

The National Sunflower Association has asked AOCS to give serious consideration to organizing a joint project to develop a rapid, standard method for estimating the wax content in crude and processed sunflowerseed oil. Most likely, such a method will be based on a nephelometric procedure. A rapid nephelometric procedure for phospholipids already has been adopted; a similar method for wax in sunflowerseed oil would permit more than one method to be performed by a single instrument.

The proposal is still in the planning stages. If undertaken, the project probably will be handled by the newly reorganized Seed and Meal Analysis Committee. Anyone with suggestions or who is interested in participating in the project should contact the AOCS Technical Director at AOCS Headquarters, PO Box 3489, Champaign, IL 61821-0489, telephone 217-359-2344.

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Publications

Book reviews

Toxic Oil Syndrome: Mass Food Poisoning in Spain, edited by Philippe Grandjean and Stanislaw Tarkowski (World Health Organization, 1211 Geneva 21, Switzerland, 1984, 92 pp., 12 Swiss francs).

This slender volume is a report of a WHO Working Group in a meeting held in Madrid in March 1983, to review what was known about the mass poisoning that broke out in Spain during May 1981. Designated as the "toxic oil syndrome," the mass poisoning, which led to over 200 deaths and more than 20,000 injuries, was traced to the sale of contaminated cooking oil in the Madrid area and in the provinces to the northwest of Madrid. Adulterated rapeseed oil treated with aniline to mark it for industrial use only was sold house to house as olive oil at bargain prices. Despite research and testing by scientists all over the world, the toxic agent has not been identified.

The volume consists of five short sections followed by six annexes. The first section contains a summary of what was known about the origin and extent of the toxic oil epidemic, clinical observations, chemical studies of oil samples and toxicological research. The second section contains epidemiological, clinical and toxicological observations by participants at the WHO meeting. The brief third and fourth sections deal with recommendations for future actions to aid the victims and prevent recurrence of a food-mediated mass poisoning. These are followed by a set of conclusions and suggestions for additional investigation and medical research.

The first four annexes are reports by individual authors. These discuss the discovery of the toxic oil as the cause of the epidemic, the case-control investigations of the toxic oil syndrome and consumption of the illegally marketed oil, the clinical and pathological features of the toxic oil syndrome and the analysis of the aniline-denatured oil, plus speculations about the processing (refining) of the oil prior to its distribution. The last two annexes are an address by the Spanish Minister of Health and Consumer Affairs to the WHO Working Group and a list of participants.

The book serves as a summary of the information available in 1983 about the mysterious toxic oil syndrome. Many questions remain unanswered; the final report remains to be written. In 1983, there were too many gaps in the evidence to allow the conclusion that toxic oil was definitely the cause. New evidence has filled in