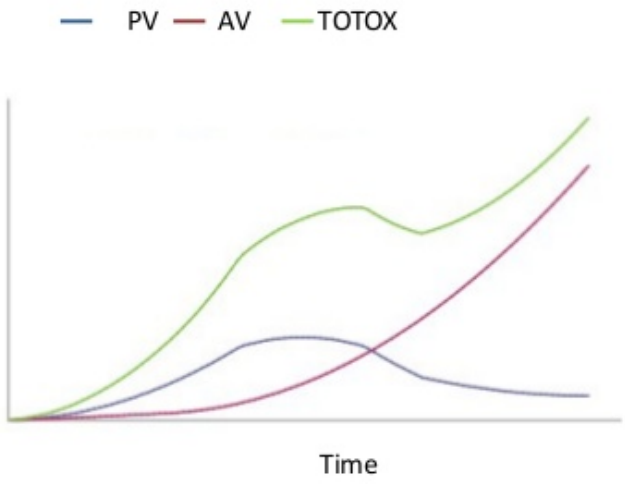
Peroxide Value, Anisidine Value and Total Oxidation Value

Introduction

Peroxide Value (PV), Anisidine Value (AV) and Total Oxidation Value (TOTOX) are used to measure the oxidation of oils and fats and the oil and fat components of feedstuffs.

Oxidation is an undesirable series of chemical reactions that degrade the quality of oils and fats, eventually producing rancidity and the accompanying off flavours and smells and affecting potential shelf life. Measuring oxidation involves testing for the primary and secondary breakdown products. The most common test is PV but very rancid oils can have a reduced PV (see Figure 1) and therefore the AV and TOTOX value are used to provide a comprehensive picture of the overall oxidation profile.

Figure 1:



The oxidation of oil over time as measured by peroxide value (PV), anisidine value (AV) and TOTOX value.

PV can decrease over time so AV and/or TOTOX calculation is needed to appreciate the whole oxidation story

Definitions

Peroxide Value:

The Peroxide Value (PV) in oils or fats is a measure of the peroxide present and therefore the level of primary oxidation that has occurred and is used as an indicator of quality. Detection of peroxide gives the initial evidence of rancidity in unsaturated fats and oils.

Primary oxidation processes in oils and fats mainly form hydroperoxides, which are measured by the PV. In general, the lower the PV, the better the quality of the oil, however PV decreases as secondary oxidation products appear (see Figure 1).

Anisidine Value:

The anisidine value (AV) in oils and fats is a measure of the aldehydes present and therefore the level of secondary oxidation that has occurred and, like the PV, is used as an indicator of quality.

Secondary oxidation occurs when the peroxides (as measured via PV) decompose to form aldehydes and it is these compounds that generate the characteristic odour associated with rancidity (see Figure 1).

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Total Oxidation Value:

The Total Oxidation Value (TOTOX) is a measure of the overall oxidation profile of a sample and is calculated from the PV and AV data and takes into account how the PV and AV results will potentially change over time (see Figure 1).

Other Relevant Information

Feed samples need to contain greater than 2% oil for the analyses described above to be carried out successfully due to the requirements of the extraction process.

If you have any queries, please contact our Customer Services department on:

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