



p-ANISIDINE VALUE ON FAT AND OIL

Innovative and Rapid Analysis Method For Determination of [p-Anisidine Value](#) on Fats and Edible Oils that Makes the Official Procedure Much Simpler.

INTRODUCTION

The oxidative process of oils and fats is one of the main causes of the deterioration of the principal organoleptic and nutritional characteristics of foodstuffs.

The complex oxidation process can be summarized into two phases: in the first one fat acids react with oxygen and determine odourless compounds as peroxides; during the second phase the peroxides degrade into many substances as volatile aldehydes, responsible of the rancid odour and flavour, and in a non-volatile portion.

The primary oxidation products are normally measured with Peroxide Value test (PV) and the secondary products with p-Anisidine test. Anisidine value (AnV) represents the level of non-volatile aldehydes, primarily 2-alkene present in the fat. On the contrary other tests consider the volatile portion of aldehydes and, due to their intrinsic variable nature, bring to results that are less reliable.

The oxidative status of a fat should be evaluated considering both its primary and secondary oxidation. In fact it can happen that a fat that has initially a high peroxide value, kept in stock for a long time in absence of oxygen, endures a secondary oxidative process that determines the decrease of peroxide value but the increase of anisidine value.

Performing only the analysis of peroxide it can happen that fats that are not fresh or damaged, are used as ingredients without having the chance to evaluate the consequences of secondary oxidations.

In summary we can say that peroxide value indicates the actual oxidative status in fat matrix but anisidine value indicates its history from the oxidative point of you.

These 2 values can be combined into the TOTOX number:

$$\text{Totox} = \text{AnV} + (2 \times \text{PV})$$

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MATERIALS AND METHODS

Anisidine value is defined conventionally as the optical density measured at 350 nm, multiplied by 100 of the solution of 1 gr of fat in 100 mL of p-anisidine - acetic acid mixture.

p-Anisidine number is correlated with the presence of aldehydes deriving from the second oxidation of fats.

The innovative [Foodlab](#) method makes the official procedure much simpler and uses a micro quantity of sample without any treatment and a single reagent pre-filled in a single use cuvette.

Materials:

- Foodlab instrument
- Pre-filled single use cuvettes
- 20 μ L pipette

The cuvettes have to be warmed at 37 ° C for some minutes in the incubation cells of the instrument. With the specific pipette you should add 20 μ L of oil or melted fat into the cuvette and after 1 minute of reaction the instrument prints the result expressed as AnV.

Reagents	Sample Volume	Wavelength	Analysis mode	Unit of measure	Calibration
Single reagent in alcoholic base	20 μ L	366 nm	Kinetic	AnV	available

Linearity	Accuracy	Repeatability	Correlation coefficient	Sensibility	Analysis time	Test/hour
100 AnV	+ - 5%	CV < 6%	R2 > 0,97	0,5 AnV	80 sec	40

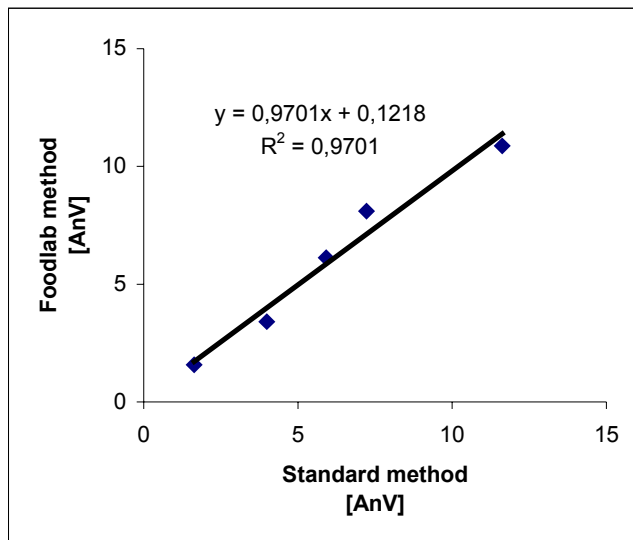


RESULTS and DISCUSSION

Comparative tests between the Foodlab method and the standard method have been done in an independent laboratory.

The two methods have a good correlation.

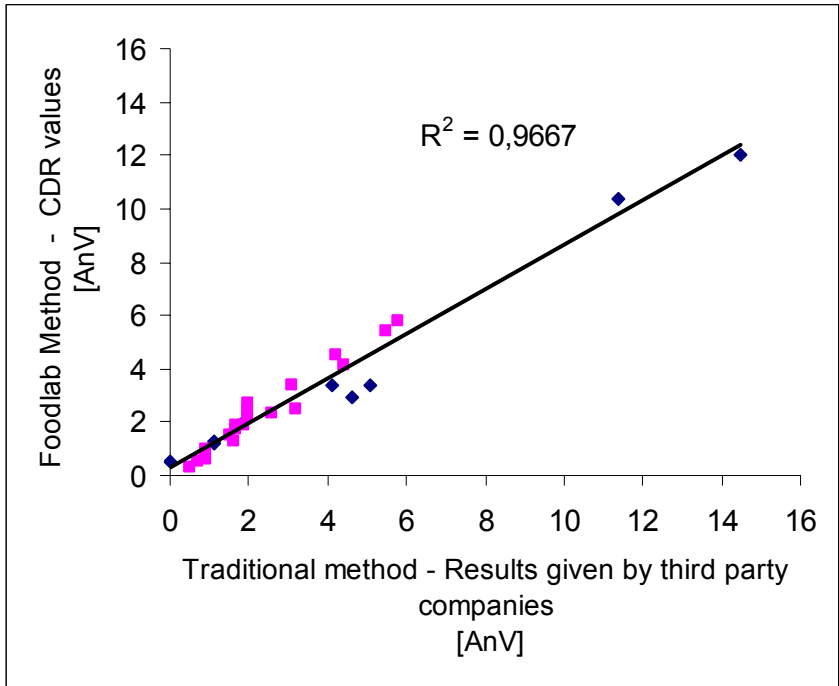
Sample	Foodlab [AnV]	Standard method [AnV]
Colza oil	1,58	1,64
Soya oil	3,41	3,99
Sunflower oil	6,12	5,92
Sunflower oil	8,10	7,22
Sunflower oil	10,88	11,62



Nineteen samples of animal and vegetal fat given by a European company and nine samples of vegetal oil of another European firm have been tested with Foodlab method and the results have been compared with the values determined with the standard method.



The two methods have a good correlation.



Repeatability tests have been done in CDR laboratory on 3 types of fat, obtaining good results.

Sample n°1 [AnV]		Sample n° 2 [AnV]		Sample n° 3 [AnV]	
Test 1	2,0	Test 1	0,9	Test 1	5,8
Test 2	2,0	Test 2	0,8	Test 2	5,6
Test 3	2,3	Test 3	0,9	Test 3	5,9
Test 4	2,0	Test 4	0,9	Test 4	5,7
Test 5	2,2	Test 5	0,8	Test 5	5,9
Test 6	2,1	Test 6	0,9	Test 6	5,8
Test 7	2,1	Test 7	0,8	Test 7	5,6
mean	2,1	mean	0,8	mean	5,8
SD	0,11	SD	0,04	SD	0,13
CV	5,4%	CV	4,5%	CV	2,3%



CONCLUSIONS

Foodlab method for p-Anisidine test is simple, rapid and reliable: it is a optimal answer to the need of monitoring the oxidative status of fat in various steps of the production process.

FoodLab has been developed, designed and manufactured by CDR s.r.l.

<http://www.cdr-mediated.com/food-diagnostics>

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