

FATTY ACIDS CONTENT CONTROL IN FOOD PRODUCTS BY GAS CHROMATOGRAPHY

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Introduction

In different food products there is a certain fatty acid (FA) composition is characterized for. Manufacturers must include the content of fats, proteins, carbohydrates, fats (saturated, monounsaturated and polyunsaturated) and energy value on the labels in accordance with current law. Plant products such as coffee, oils and soy has a specific interrelation of fatty acids. Mainly they are palmitic, stearic, oleic, linoleic and others. For example butter has a specific indicator of fatty acids content such as lauryl, myristic, palmitic, stearic, oleic and linoleic and their ratio, which indicates the quality of the product.

Material & Methods

The reaction which is the basis of the method:

FA + Sodium methylate = Fatty acid methyl esters (FAME)

Reagents

Fatty acids methyl esters : lauryl (C12.0), myristic (C14.0), palmitic (C16.0), heptadecanoic (C17.0), stearic (C18.0), oleic (C18.1), linoleic (C18.2), arachidonic (C20.0) .

Solvent: hexane

Apparatus

Gas chromatograph: HP-6890 Plus;

Detector: flame ionization detector;

Column: ZB-FFAP 30×0,32×0.25

Carrier gas: Helium

Injection volume: 1 µl

Total run time: 10 min

Linearity

FAME	Retention time, min	LOD, ppb	LOQ, ppb
C12.0	3,16	0.04	0.11
C14.0	3,68	0.02	0.06
C16.0	4,64	0.04	0.13
C17.0	5,37	0.03	0.09
C18.0	6,36	0.04	0.12
C18.1	6,67	0.04	0.11
C18.2	7,31	0.03	0.08
C20.0	9,45	0.02	0.06

Results

Analysis of butter

FAME	Limits	Sample 1	Sample 2	Sample 3
C16/C12	5,8-14,5	10,54	11,90	10,69
C18/C12	1,9-5,9	2,90	1,64	4,50
C18.1/C14	1,6-3,6	1,82	12,76	2,96
C18.2/C14	0,1-0,5	0,18	5,77	0,30
C18.1+C18.2/C12+ +C14+C16+C18	0,4-0,7	0,39	1,07	0,59

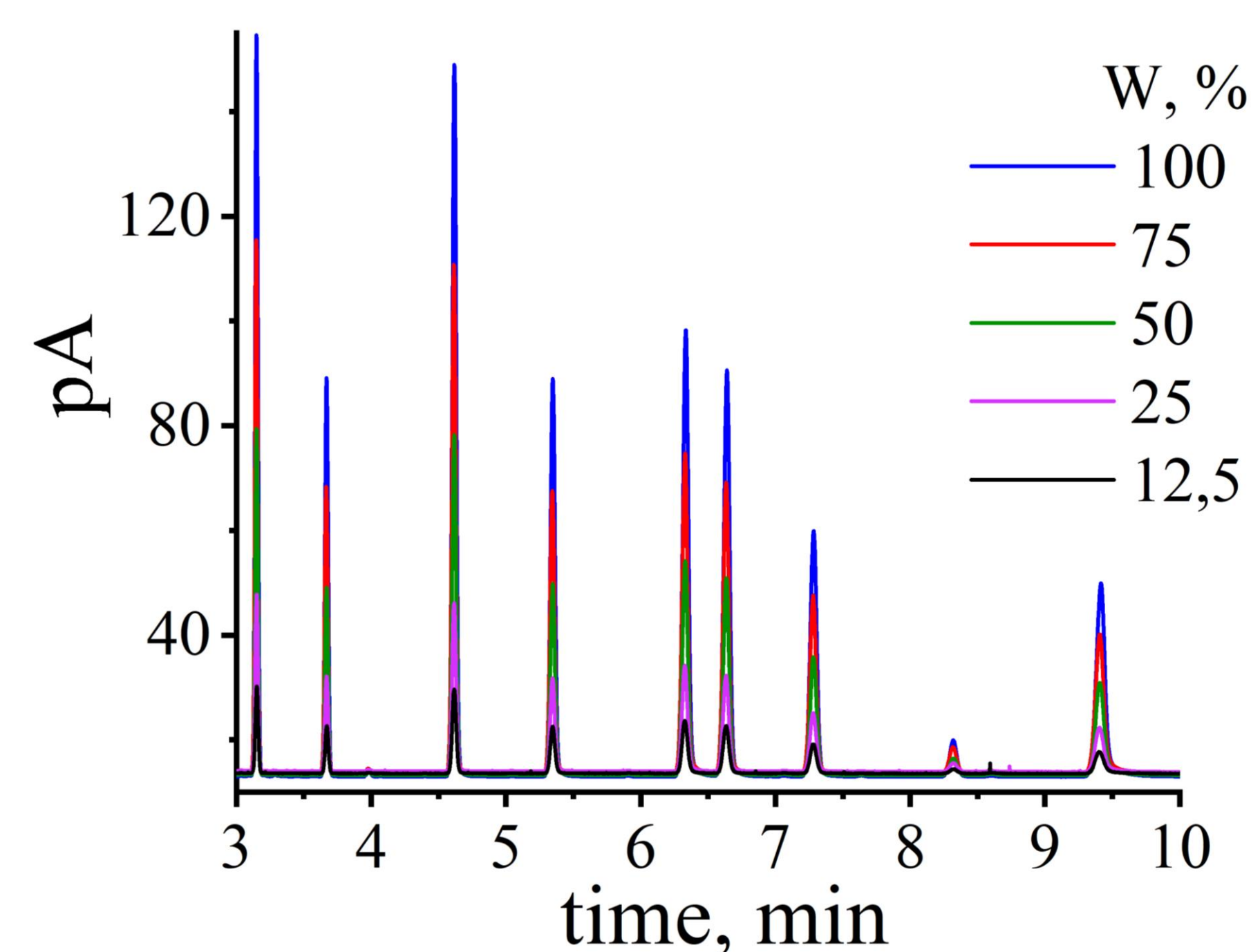


Figure 1

Chromatograms of FAME at different concentrations

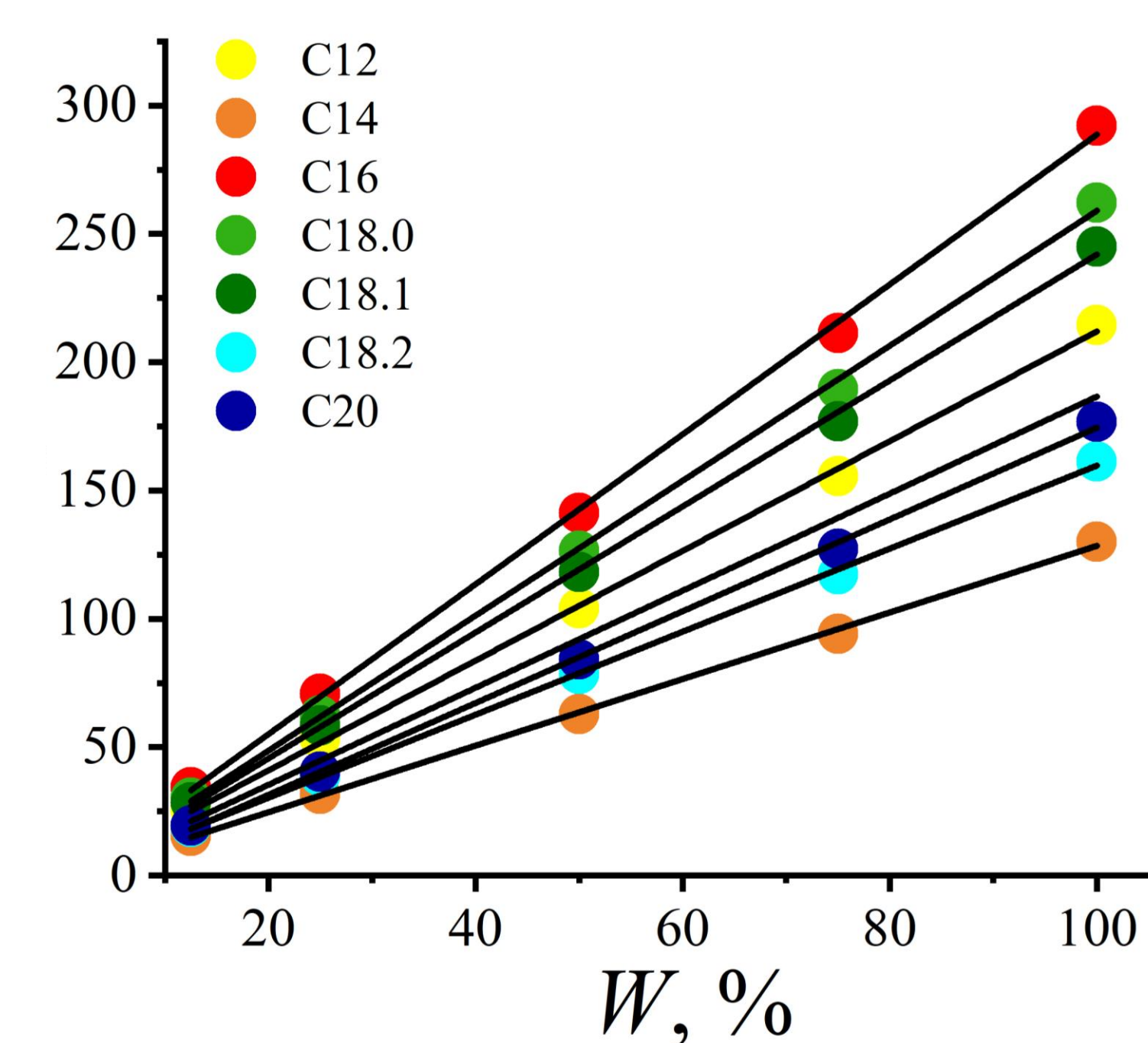


Figure 2

Calibration graphs of FAME

Conclusions

The method was tested during the analysis of food products (coffee, various oils, soy, confectionery, butter). About 20 samples of butter with different fat content were analyzed. The development method was validated by the criteria of specificity, linearity, repeatability and stability.

This method is planned to be used for routine analysis of fatty acids content in food products.