**The relationship between the structure and functionality of the essential PUFA delivery systems based on sodium caseinate with phosphatidylcholine liposomes without and with a plant antioxidant: an in vitro and in vivo study**

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## Methods

### Estimation of the efficiency of the encapsulation of the liposomes PC–FO or PC–FO–EOC by SC

Aliquots (3 ml) of diethyl ether were added to the glass vials containing 5 ml of either the pure liposomes (PC–FO, PC–FO–EOC) or their complexes with SC. It is important to note here that the concentrations of the pure liposomes were equal to their concentrations in the solutions of the complexes in all experiments, including *in vitro* modeling of their digestion in GIT. All the vials were shaken gently, conditioned at room temperature for 30 min and then placed in a fridge at 7 $^0$C for the extraction during 24 hours. The concentrations of free lipids in the samples were estimated spectrophotometrically (SF-2000, UKB Spectrum, Russia) by measuring the absorbance ($A$) of the diethyl ether extracts against a pure diethyl ether, as a blank, at λ = 210-215 nm.[1-3] The efficiency of the encapsulation of the liposomes PC–FO and PC–FO–EOC by SC was calculated by the following equation:

$$E = 100 \times (A_{\text{initial}} - A_{\text{free}})/A_{\text{initial}} \quad (1)$$

where $E$ is the efficiency of the lipid encapsulation in %; $A_{\text{initial}}$ are the absorbance values for the diethyl ether extracts from the aqueous solutions of the pure liposomes either PC–FO or PC–FO–EOC. These values have been taken as 100%; $A_{\text{free}}$ are the absorbance values for the diethyl ether extracts from the aqueous solutions of the complexes SC–PC–FO and SC–PC–FO–EOC.

The results presented in this work were the average of at least of the three independent experiments. The estimated experimental error of the efficiency of the encapsulation by this method was not more than ± 10%.

## References


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