

## Replacing Fat with Protein/Oil/Water Emulsion

Preparing protein/fat/water emulsion is practiced by commercial producers. Such emulsion is kept in a cooler until needed. It is a very practical solution for making reduced fat sausages. Think of it as a fat replacer solution that offers many advantages:

- It can be prepared in advance.
- Making emulsion is a clean and simple process.
- Its calorie content is well defined.
- It does not provide any cholesterol.
- It preserves the original texture and mouthfeel of the sausage.

Oil emulsion is easy to administer and its calorie content is precisely defined. A 100 g chunk of emulsion provides 398 calories. One hundred grams of fat provides 900 calories.

### soy protein isolate/oil/water emulsion 1:4:5

	100 g	200 g	300 g
SPI (92% protein)	10 g	20 g	30 g
Vegetable Oil	40 g	80 g	120 g
Water	50 g	100 g	150 g
Calories	398 cal	796 cal	1194 cal

As all recipes are calculated for 1000 g material (100%), and it is extremely easy to calculate the amount of emulsion. Ten percent emulsion is 100 g, twenty percent is 200 g and so on. Let's assume that a recipe calls for 70% lean meat and 20% fat, the rest being water and other ingredients. Use 700 g of lean meat and 200 g emulsion, that simple. You don't need add more water, as 1/2 of the emulsion is the water. All 200 g of fat is replaced with 200 g emulsion. No animal fat was used and 80 g of oil was introduced. The original animal fat supplied 1800 calories (200 x 9 = 1800), but the 200 g of oil emulsion provides only 796 calories. The net result is elimination of 1004 calories and most of the cholesterol from the sausage.

Soy protein concentrate (SPC, 70% protein) is commonly added to home made sausages, but will not produce an emulsion. Soy protein isolate (SPI, 90% protein) produces the real gel: a white, soft, cream cheese-like substance that tastes like fat. Soy protein concentrate (SPC) produces a yellowish paste at best. In addition SPC will not even make a paste when used at 1:4:5 (SPC : oil : water) ratio. The amount of SPC has to be increased and the final product is still a paste. Soy protein isolate is pure protein with a very few impurities and that is why it makes such a great emulsion. Although SPI is slightly more expensive than SPC, it is used in such a small amount that the price should not be the decisive factor.