Animal Breeding
Poultry and Fish farming
Bee Keeping

Animal Breeding

Use of magnetic technologies in dairy production has the following benefits:

1. Change in production processes of yogurt, cream, butter, cheese

- Reduces time of production process
- Improves taste properties
- Increases shelf life of finished products

Since each production process has its own specifications, we need to do the following:

1. Study in detail you production process and products.
2. Determine the most desirable areas of activity
3. Select the right equipment

Many years of practice allows us to assert that a combination of the above enables to obtain an economic effect on average around 20-30%.

2. Solubility of dry milk.

Experiments involved using magnetized water to dissolve dry milk powder (before powder dissolves) and solution of water powder. It has been established that solubility increases significantly. Amount of raw sediment is reduced by about 1.5 times.

3. Structural and mechanical properties of starter cultures and fermented milk products.

It is found that by increasing magnetization time, levels of whey production proportionally reduce and viscosity of starter culture increases. Depending on a type of starter culture, the degree of syneresis is reduced by 25-35%, respectively viscosity increases by about 40-45%. This method can be used in the manufacture of dairy products by enducing consumption norms.

In the production of cottage cheese from magnetized milk, amount of

protein in whey reduces by about 20-25%, respectively increasing the amount of protein in cottage cheese.

4. Growth and development of yeast cells.

Research shows that magnetic fields have a positive effect on biochemical activity of yeast cells in a combination ferment.

Produce made using a combination ferment have higher alcohol content, more volatile fatty acids and carbon dioxide, higher degree of dispersion and better digestibility of the product.

Magnetization using magnetic systems increases shelf life of dairy products by almost two times.

Experiments also tested electromagnetic systems which researchers abandoned due to poor results.

Effect of a constant magnetic field on the yield of protein products

Increasing production efficiency depends on methods of processing raw materials. In this case savings of material resources is extremely important.

Food and dairy industries often use processing methods such as microwave field effects of ionizing radiation, infrared excitation, ultrasound-treatment and treatment with constant magnetic field. The latter method has many advantages as it does not require electrical supply, adjustment during operation, reconstruction or modernization. Magnetic systems are structurally simple, easy to install, do not require special operating conditions and are safe to use in food biotechnology with a magnetic induction in the center of the working gap 40 +10 mT.

Treatment using magnetic field has been applied in many areas of national economy and medicine.

The aim is to study the influence of magnetic field on redistribution of protein at different stages of its formation.

There is a lot of research on behavior of milk proteins at pasteurization,

sterilization, enzymatic treatment and mechanical stress. It is well known that the most unstable is a protein fraction, precisely a part containing more unstable hydrogen and Van der Waals bonds.

We have studied the influence of magnetic field on the redistribution of protein fraction into whey using magnetized milk or ferment in the production of acidophilus drink (see Fig.1) or magnetized milk in the production of cottage cheese prepared using different methods of coagulation (see Fig. 2).

Fig. 1

Magnetic field (40mTl)

↓

Milk

↓

Pasteurization

↓

Cooling t = 40 ° C

↓

Souring, τ = 4-5 hours

↓

Allocation of serum t = 50C, τ = 10 minutes

↓

bezkainovaya serum

unclarified serum

Thermocoagulation of serum proteins

t = 595-97S,

Time 20 minutes

Whey proteins Proteose peptone fraction

Fig.2

Hlorkatsievaya coagulation

Milk (magnetic field)

↓

Protein precipitation t = 95-97S, 0.7 ml of 40% CaCl 2, τ = 5 minutes.

↓

Separation of serum V = 3 m / v, τ = 10 minutes

↓

Casein Free Serum protein

Rennet-acid coagulation

Milk (magnetic field)

↓

Pasteurization

↓

Cooling t = 32C

↓

Coagulation protein (1% + 2.5 leaven ml of 2.5% solution of SF)

↓

Separation of serum (cutting and endurance 10 minutes)

↓

Separation of serum V = 3 m / v, τ = 10 minutes

↓

Casein Free Serum protein

Acidic coagulation

Milk (magnetic field)

↓

Pasteurization

↓

Cooling t = 32C

↓

Souring, τ = 8:00

↓

Serum separation V = 3 r / v, τ = 10 minutes

↓

Casein Free Serum protein

In casein-free and clarified ferment, content of water-soluble protein was determined by spectrophotometry in UV area.

Protein content was calculated using formula:

C = 1, E 45 280 - 260 0.7%

Yield of casein was determined by weighing, followed by recalculating it onto given humidity (80%) using formula

Mpriv. = Mkaz. * Wf / 80

Table 1 shows the effect of magnetization on a transition of protein fraction into whey in acidophilus product.

Table 1.

Type of serum	Control	Experience	
		Magnetized milk	Magnetized milk
Casein Free Serum	0.6797	0,614	0,576
Protein-free serum	0,348	0,265	0,227

Note: The total protein content in milk - 2.9%

Data in Table 1 shows that regardless of the magnetization method, moment of separation of the clot into protein mass using magnetized milk gives additional 12% of protein; and using magnetized fermentation gives additional 18% of protein.

Significantly increases amount of denatured whey proteins. After exposure of whey fraction to a magnetic field absorbing UV-light at λ260 and λ280 NM, protein content reduces by 24% (magnetized milk) and by 36% (magnetized ferment).

Similar results were obtained by methods of protein coagulation (see Table 2). However output pattern remains the same- during calcium chloride coagulation amount of protein transition increases by 48.3%, during rennet-acid coagulation by 26.3% and during acidic by13%.

Table 2.

Effect of Permanent Magnetic Fields on yield of protein mass.

		Balance products					
	View coagulation	Milk	Serum	Protein			
				Weight	% W	When the Vedas. W	Growth
Control	Hlorkalts	245.8	186.6	47.9	74.5	44.6	-
	Sych.kisl.	258.2	186	49	67.7	41.5	-
	Acid	258.2	190.3	44.7	68.8	38.4	-
Experience	Hlorkalts	239.6	161.9	72.8	72.8	66.2	148.3
	Sych.kisl.	256	176.4	59.6	70.2	52.3	126.2
	Acid	258	188.5	46.5	68.1	39.6	113.1

By applying magnetic fields on a system containing colloidal particles in the presence of Brownian motion and charged particles, a Lorentz force is created which tries to bring particles together, ie, under the influence of this force particles can overcome the potential barrier of the repulsive forces more than smaller initial particles. Growth in the size of the particles suggests that forces of molecular attraction of aggregated

particles also increased, therefore associate is more watercut compared to initial particle and it aggregates. Therefore treatment of milk prior to fermentation or thermo-coagulation with magnetic field is a processing method with a lot of potential and can be widely used in the industry.

Department "Technology of milk and milk products." Vasilyeva RA, Ulan-Ude, 1999.