Effects of Technical-Technological Alterations on Quality

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In the last year a research work was worked out in our Institute - within a team work - entitled "Effect of Applied Technology and Technics on Quality of Final Product". Searching aim was to mark such a general survey which makes a uniform practice possible during selection of certain technological activities in branches or of up-to-date technics and which enables to give proposals to future work.

Now we inform you about work which was accomplished in the field of meat industry. We examined such activities, which are most important from the point of view of export. Following four meat industry production lines were examined: cattle-slaughtering line, swine-slaughtering line, salami-producing line and canned ham producing line. There were industry-, veterinary- e.t.c. experts in our team. At all technological lines the production process was examined from the point of view of quality.

1/ Effects of technical-technological alterations on product quality

Production and its technological conditions are in continuous development. There is revolutionary development in this field. Connection between technologies and of processing is mutual and extremely complex. The change is resulted by two kinds of processes:

- firstly, improvement of traditional technics and technology is a permanent factor,
- secondly, searching activity can set up new accomplishments which result more recent products.

These changes equally refer to planning-, insurance- and control elements of complex quality regulation. Application of type-technologies aims a "standard" product quality. A further positive change is atteinable in this field by working up a unfied system which contains correctly determined prameters. Not only volume, quality, variety, up-to-dateness and nutritional value are significant in selecting technological methods and technical solvings. We must reach a nearly optimal input in production process. One of main problems here is great variety of food industry technologies which makes the choice hard among them. On the other hand settling and plant-size factors also have an effect on it.

But there is a main ordering principle which needs a consequent application. In the first step we must ascertain quality of finished product because it determines both quality of raw material of agricultural origin and of technics and technology. Consequently: quality of finished product is the starting point during technical development.

Undoubtedly there are a lot of factors which have an effect on quality of intermediate or finished products, but basically these are structure and inner value of raw materials. Quality of used ingredients are also not negligible. External operational circumstances, surface of those parts of machines which directly touches raw materials e.t.c. have also an effect on it. Complexity of production lines and technologies as well as applied technological heat-regime undoubtedly determine quality level of finished product.

Whereas raw material of food industry products are of biological origin we have to pay greater attention during production to quality development of intermediate products.

Generally application of technics and effectiveness of technology are differently

discussed in literature of economics.

It is expedient to examine the dialectical unit of applied technics and technology in time and space. For this reason it is necessary to study the activities of head- and ancillary plants of industrial enterprises in respect of plant total output. Both activities effect on product quality /in different ways in the field of measure and effect mechanism/. Capacity utilization of activities are different, but their justifiability can be required. The effectiveness of production can be increased on principle in two ways:

- by improvement of technological conditions, which appear in decreasing production costs,
- by product- and technological innovations.

In the first case the aim is optimalization of conditions. We have to take given relations and suitability into account during production of use-value. Lastly, improvement of production-technological conditions increases the effectiveness, sources of production can be better utilized and quality of use-value raises to a higher level.

It is indisputable the necessity of technological innovation. It is well used to reduce the socially necessary labour in use-value. When manufacturing of a product is not effective enough, but it is an article much called for the technological innovation is the only possibility to solve the problem in shaping different technological variants it is not negligible the time factor which have an effect on scientific-technical development objectively. During planning beside definition of aims and prognostization of resources we have to take also technical-technological variants into consideration , which make the quick returns sure.

Basically it is right but it is necessary to take time factor into account to a greater extent as well as its significant effect in the function of technical-and technological changes. One of main respects in choice of a variant is the demand on product in market. Another important point of view is the rate of connection with development trend of world. We have to collate the level of new parameters to the rhytm of technical level - which generally increasing - as well as planned development dynamics of individual industries. The quality of applied technics is the base of economic development. For instance, there are investments. Automatization, mechanization etc. and energy saving need a high level machine-stock. The high quality machine-stock decrease the production period of investments. Mounting and preliminary operation time will be shorter. In consequence it is possible to reach the planned parameters earlier than ever before.

Designer offices, machine-shop firms as well as industrial enterprises practically have only "direct" technological experiences. The so called "indirect" marks concerning to output and manageability of product are not negligible and to which the only way leads through market and consumers. This field was neglected up to the present. Usefulness or different technological-technical variants gets known during marketing, by means of reaction of domestic- and international markets.
Tendency of modernization technology and technics in several countries is generally followed by displacement of labour power.
Mechanization, automatization and shaping of complex production lines resulted that production activity of a person would be fivefold-sevenfold amount. /Increasing rate of investments was lower during the same period./

Generally it can be said that scientific-technical revolution changes the process of product shaping very radically and in connection with that it changes the technology itself. This tendency goes from strength to strength during the years.

2/ Disintegration of single technological phases into basic /c/ and quality-sensitive cross sections /Q/

Single technological lines have convenient capacity which actually means - in certain circumstances - the known producing limit - at a given point of time - of manufacturing equipments.

The single producing processes consist of convenient phases which can be suitably disrupted on basis of certain criteria.

During our research we would have like to examine the effectiveness of single technical terms. It means the classic explanation of production /phase/ cross-section.

According to technical literature the production cross-section of basic production line is determined by its primary-type mechanical solvings.

Capacity of basic production units and lines is determined by basic cross-section /phase/. However the base of perviousness is the narrow production cross-section. Winding up of narrow production cross sections not the capacity but the capacity utilization will improve.

Examining the four different meat industry production lines 72 production phases were studied /of which 54 % was the number of mechanical phases/.

Table 1. Percentage of quality sensitive mechanical and manual phases from observed production phases

lines	phase	Q + Q + C	of which		%	
			mechanical	manual	mechanical	manual
Cattle	20	10	3	7	30	70
Swine	16	12	5	7	42	58
Salami	15	9	6	3	67	33
Canned ham	21	8	7	1	88	12
Total	72	39	21	18	54	46

Table 2. Number of observed production phases and their distribution to basic /C/ and quality sensitive /Q/ cross-sections

lines distribution	phase	of which			
		Q			C
Cattle	20	7	-	-	3
Scalded swine	16	9	-	-	3
Salami	15	8	-	-	1
Canned ham	21	7	-	-	1
Total	72	31	-	-	8
Per cent	100	43	-	-	11

Such production phases became determinable at different technological processes which were both basic cross-sections and played significant role in shaping final quality of finished products.

Main quality faults at these production phases:

Cattle slaughtering line

	mechanical skin shelling	- external dirt
16.	cleaving of backbone	- inaccurate halving
20.	pre-cooling	- stuffiness

Swine slaughtering line

7.	scalding	- incomplete depilation
9.	postcleaning	- incision of skin, residuum of bristles
16.	precooling	- stuffiness

Salami production line

12.	drying, maturation	- colloidity, through fattening

Canned ham production line

15.	heat treatment	- aliving vegetative seeds

General conclusions

1. There are results in the field of complex quality-regulating systems, but still there is not suitable practice in evaluation the technical authenticity of producting equipments. Firstly it refers to investigation from point of view of quality sensitiveness.

2. Production-technological cross-sections are not necessarily equal to quality-sensitive cross-sections. As it was mentioned at classic capacity determination the mechanical oporations are taken into account in the first place. In our study all the phases were examined from the point of view of quality.
   For us all phases are important - or mechanical, or manual - because all have significant influence of food industry raw material.
   Small deviation of parameters /water, heat, airspeed, press-time, etc./ can result small changes, which are not correctable during further processes, consequently further working processes will not be regular.

3. We have to take all important production phases into account independently of their mechanical or manual characters.

4. According to our experiences all basic production phases have significant effect on shaping quality.

5. Nearly half of analysed production phases is manual operation.

6. We have to pay greater attention to those cross-sections /Q+C/ which correspond with each other from both points.

7. It is necessary to improve the degree of mechanization of technological processes in order to establish a greater production density and a complex quality controll system.