Agribusiness Management

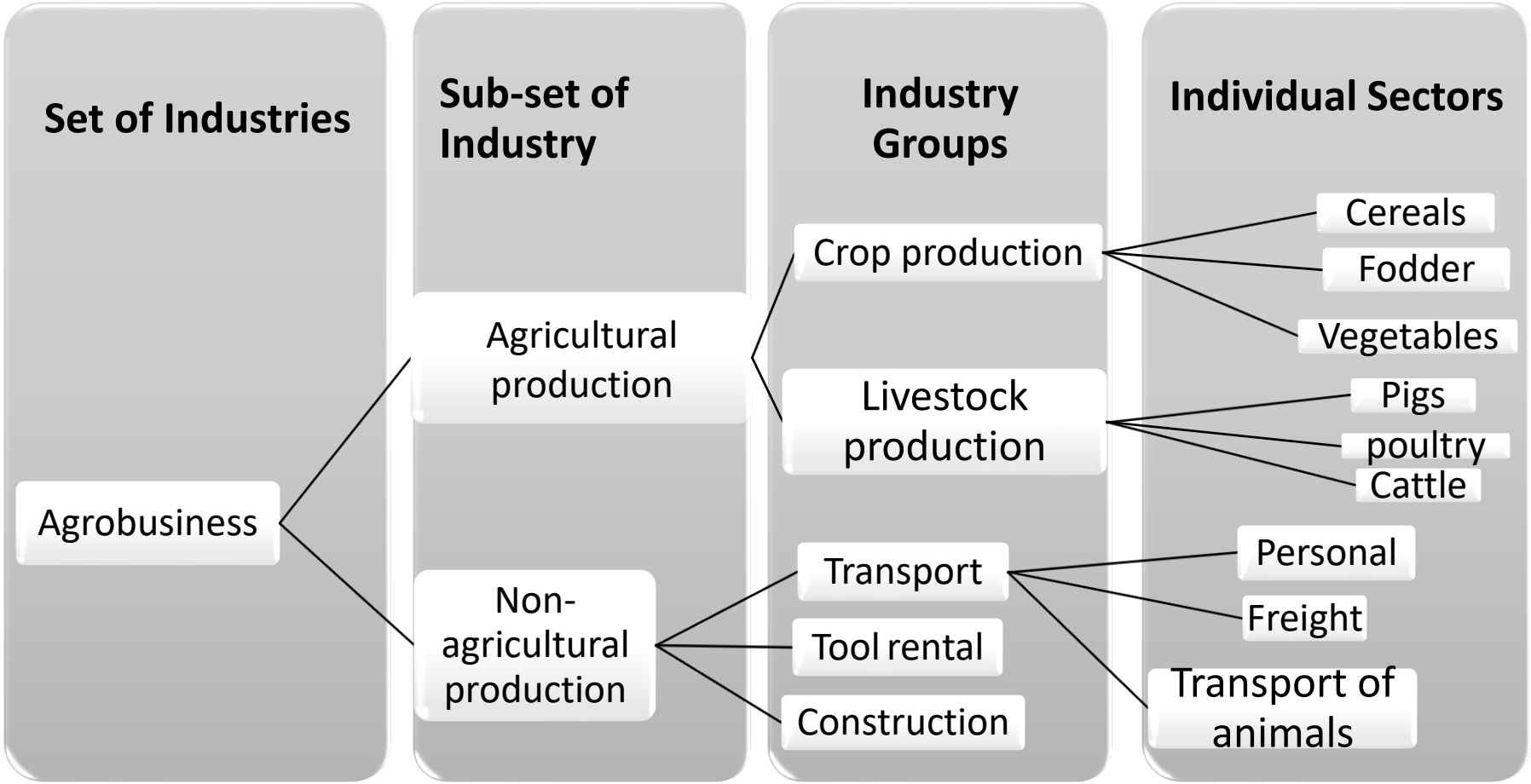
Management of Production

Agribusiness management

- Agribusiness is defined as an economic sector linked to agriculture and livestock, from the beginning to the end of the chain, involving:
  - Inputs production,
  - feedstock production,
  - feedstock processing and distribution, and
  - other services up to the end consumer or export.
- Thus, agribusiness GDP is measured based on the total value added of the sector to the economy, evaluated within market prices, in other words, including indirect taxes without subsidies.
- Besides, it is divided into two major productive sectors: crop and livestock production.

Features and peculiarities of Agricultural production

Agribusiness production industries



The set of agricultural industries

- **Agriculture industry**: part of production of a certain business unit, that produces one or more related products originating from the same source, but which differ from other technologies, organization and end products.
- **Auxiliary production sector**: non-agricultural production sectors contributing to ensure the main operation of agricultural production.
- In order to **make more efficient use of inputs and resources**, but also to improve profitable revenues, the undertaking organizes, in view of the given production and economic conditions of the so-called associated production within the associated production sector (transport or repairs for others, etc.).

The set of agricultural industries

- When selecting the industries in the agricultural primary production entity, a number of factors should be taken into account:

Within the crop production sectors	Within the sectors of the livestock production
the operation of the sector on land,	the impact of the combination of industries on the need for organic fertilisers, bulk feed and stems,
requirements for organic fertilisers,	optimal concentration of environmental sectors,
the inclusion of the crop in the sowing procedure,	possibility of adaptation for multiple sectors of environment,
demands on the need for work and mechanising agents during vegetation.	combining the sectors according to the smooth and efficient use of labour during the year.
demands on single-purpose machines,	

The set of agricultural industries

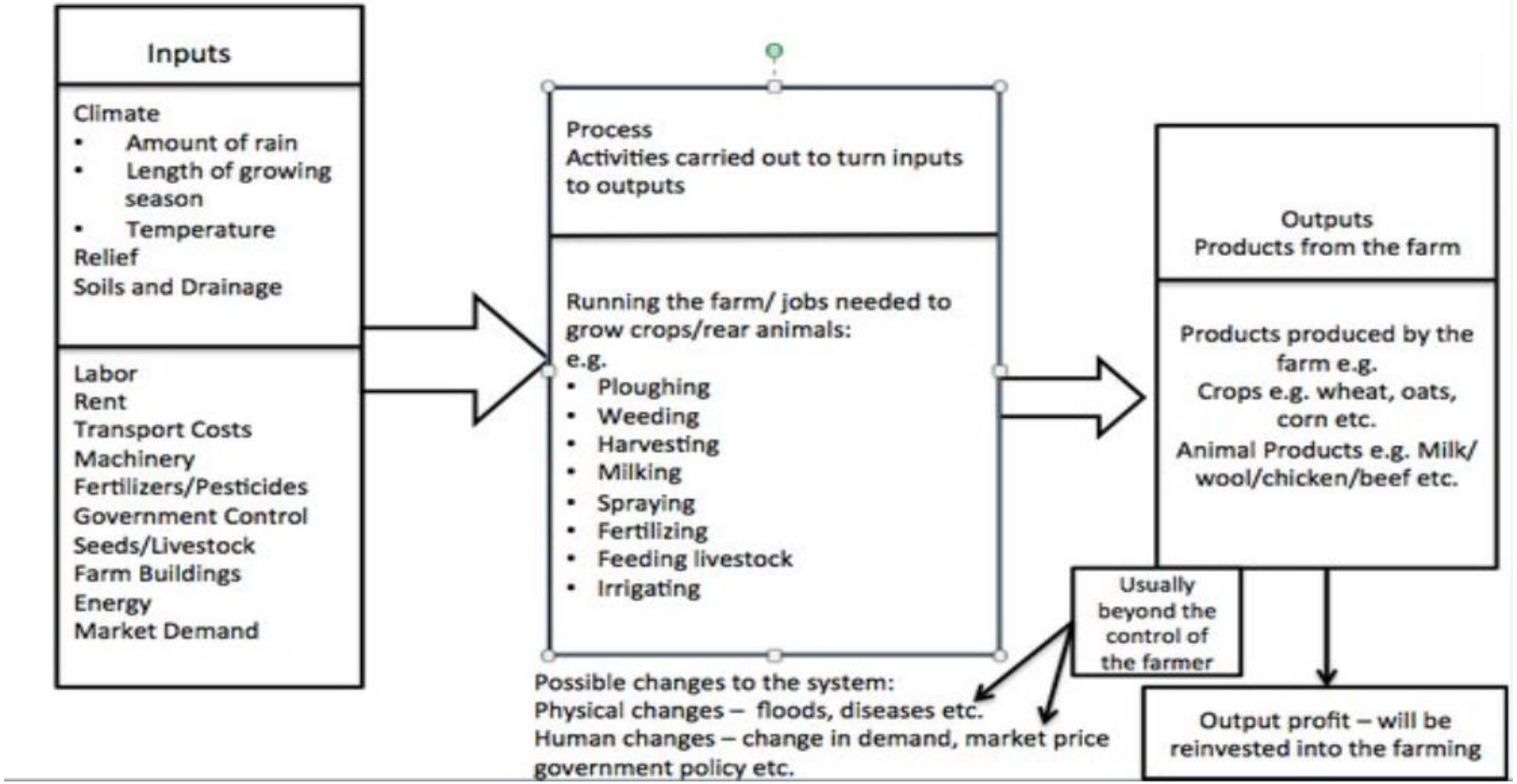
According to the feasibility of the products, the industries are divided into:

- **market industries:** those sectors whose products are realized in addition to a business unit,
- **non-market industries:** those whose products are consumed as an intermediate product within a production-organizational unit.

Another classification of industries is the **share of the output of a given industry** or group of industries in the total volume of market output of a business unit:

- **The main ones:** which participate the most in the creation of market output of the entrepreneur (usually one to two sectors of crop production and one to two sectors of livestock production),
- **additional ones:** which participate marginally in the creation of the entity's market output. However, their importance is underlined by the agrotechnical need for crop rotation and the use of by-products in the unit,
- the **sub-sectors:** those which make maximum use of the natural and economic conditions of the agri-subsidy and contribute marginally to improving profit (e.g. fish farming, bee farming, etc.).

Farming system: Imputs, Process & Outputs



Pagotto, M., & Halog, A. (2016). Towards a circular economy in Australian agri-food industry: an application of input-output oriented approaches for analyzing resource efficiency and competitiveness potential. Journal of Industrial Ecology, 20(5), 1176-1186.

Links between agricultural sectors

Despite the relative autonomy of the agribusiness industries, these are linked with associates caused by the biological nature of agricultural production. The links between sectors have their own:

- **Economic side**: determined by the production, value and profit. In market-oriented agrosubject, the relationship should apply:

Own production + Purchase needed ≥ Sales + Own consumption

- **Material aspect:** determined by biological, technical and work nature. On this basis, it consists of the industry's claims for individual factors in the production process. In particular, this is reflected in the requirements for:
    - Soil
    - Workers
    - means of long-term tangible assets,
    - outputs from other sectors material side

Links between agricultural sectors

The **relationships** between industries arising from the industry's claims for factors in the production process may be:

a) competitive (competitiveness),

b) support (two-way action),

c) relationships of dependency (unilateral action),

d) mutual replenishment,

e) neutral relationships.

The following links between the industries are affected by **forces** causing changes in production:

- **integration:** which act in the direction of joining or combining industries (e.g. crop rotation, use of universal means, etc.),
- **differentiation**: resulting in the exclusion of certain sectors from the business entity (as a result of the distribution of labor and the concentration of production, egg production and others have been set aside from conventional agro-entities).

Functions of agricultural production

- **Production function**: the assessment of natural-climatic conditions, in particular soil production efficiency, efficient use of production resources and existing capital endowment to achieve the necessary agricultural production and subsequent profit. In doing so, it is necessary to take advantage of the nature of market conditions with regard to the local, regional, national or transnational market.
- **National economic function**: consists of a contribution from the use of agricultural land, a prerequisite or directly helps to develop other economic sectors. In addition, primary production agri-entities can cooperate in the entrepreneurial use of resources (e.g. providing labor for maintaining and developing the territory's infrastructure, thus creating the conditions for recreational activity in the territory, while creating conditions for trade, crafts and small business).
- **Economic function**: consists in the contribution of the industry in the creation of the mass of gross domestic product and in the creation of resources for accumulation, investment and consumption.
- **Social function**: lies in the contribution of the sector in addressing overall employment and the use of available labor resources. The contribution of the sector to the demographic reproduction of the population and its impact on migration and population mobility processes are also significant.
- **Cultural function**: role of the agricultural production sector of a given territory to help preserve the historical structure of settlement, building monuments, settlement communities, etc.
- **Ecological function:** determined by such use of agricultural land and provision of production, which will allow to maintain the relief and character of the landscape, protection of water resources, air and the soil itself, protected natural units and creations, rare biocenosis, etc.

Fundamental differences of agricultural production

a) **The biological nature of production**: determined by the influence of other factors on the living organism (soil, plant, animal). This living organism undergoes different developmental stages, which also results in different demands on inputs and environment. In addition, the continuity of reproduction of biological organisms and also the close follow-up of the production processes of plant and livestock also result from biological nature.

b) **Time mismatch between production & working hours**. An example is the production time of winter wheat, which takes about 300 days, while the working process takes *2-3* days.

c) **Low cyclicality of production:** in most sectors of crop production represents one production process in one year.

d) **Dependence on seasons*:*** which is particularly pronounced in the crop production sectors.

e) **Dependence on soil and climatic conditions:** different according to the production conditions of Slovakia.

f) ***The risk of*** **production:** characteristic of the leguminous, rapeseed, etc. industries.

g) **High material and technical equipment**, as *a* rule, favorably affects the course of biological processes, but at the same time reduces the risk in agricultural production.

h) **The multi-production** of agricultural production is determined by the fact that several products are based on individual production processes, the collection and processing of which requires additional inputs.

Production process in agro-production

Production process

The production process in agriculture: represents a sum of work and technological events that take place in the **gradual transformation** of inputs into the resulting product, under the activity of workers, long-term tangible assets and other natural factors.

- The production process represents the **dynamical side** of production.

The **basic factors** of the production process are:

- employee(s),

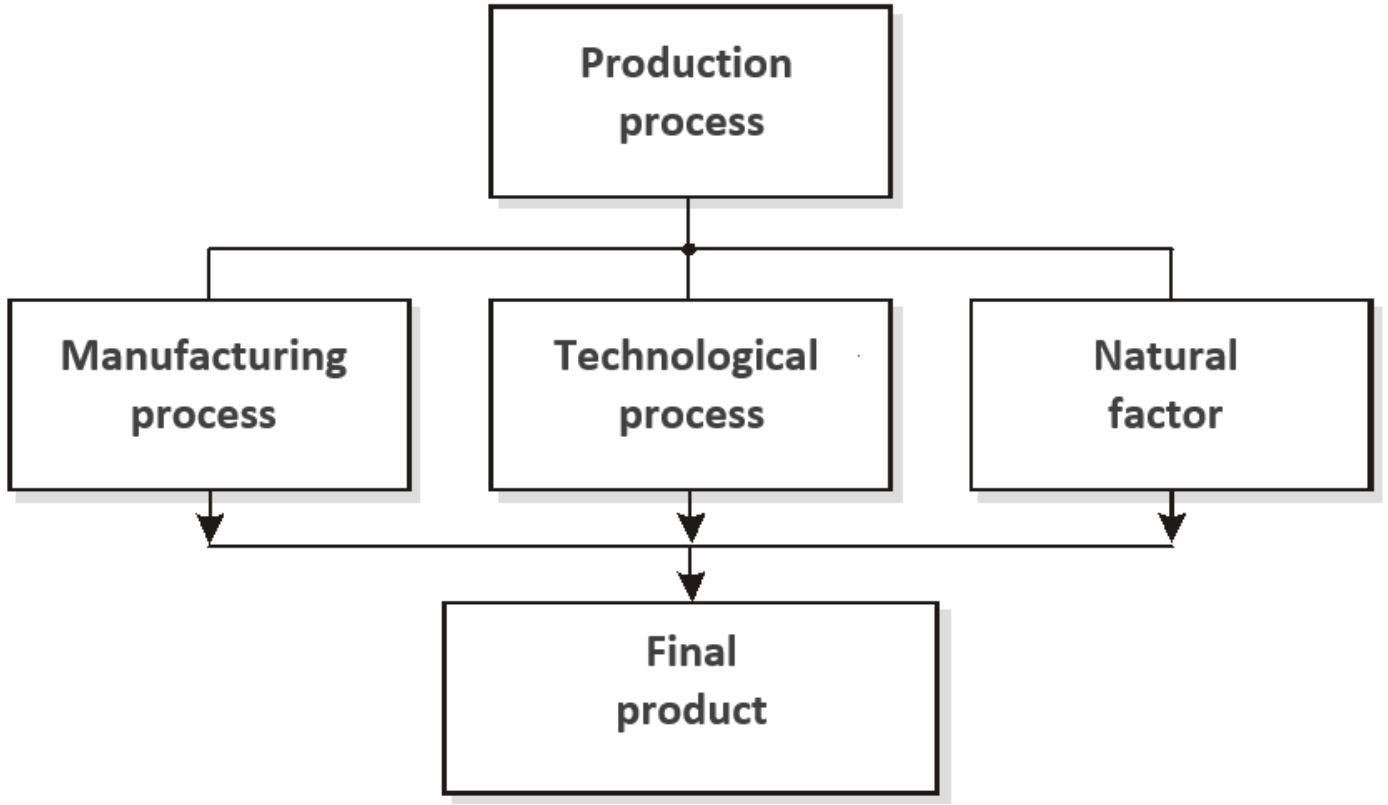
- material assets,

- Imputs (production sources)

- In addition, knowledge of scientific and technological progress.

Production process

- The composition of the production process in agriculture:



Source: Paska 2009

The mission of the production process

- The mission: the creation of products for successful business activities.

Each production process can be **characterized by** the following features:

- Certain stated **objective**,
- **Limited area** in which it is itself implemented,
- Certain **technology**,
- Certain **input** requirements.

Example

Each production process takes place on a separate plot or in a housing building.

- A single industry may include several production processes.
- For example, if sugar beet is grown on 5 hoses, this represents one industry in the business unit with 5 separate production processes.
- The same applies in livestock production in the production of milk in three cowsheds. This represents one industry with three separate milk production processes.

Basic terms of agriculture production

- **Production equipment**: a complex of work equipment that helps to obtain several specific products (e.g. housing, building, land, work machine, etc.).
- **The working process**: determined by the worker's relationship with the means of tangible fixed assets in the production of products.
- **The technological process:** a summary of the events in which qualitative and quantitative changes in input elements occur in the production process.

Production structure

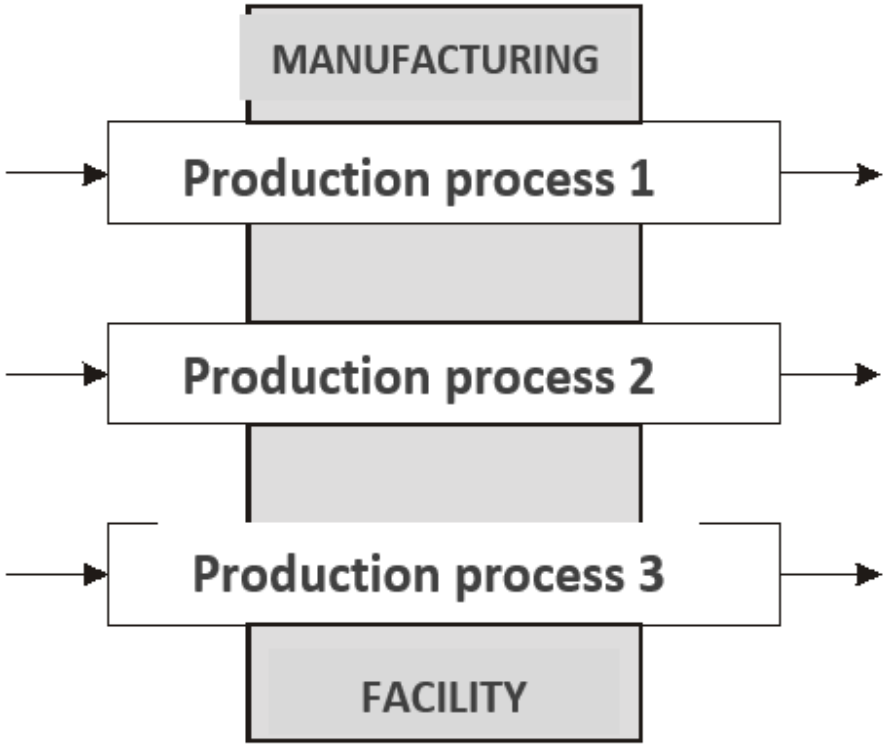
Production structure

- The organization of production processes in the agri-production depends on the nature of the industries and the relationship of the industries concerned to the production facilities.
- An important indicator of arrangement types is the routing and interconnection of inputs and outputs of production processes in the primary and secondary areas of agri processes.
- We distinguish the following ***types of arrangement of production processes****:*
  - **parallel arrangement**,
  - **serial arrangement** in **one** production facility,
  - **serial arrangement** of production processes in **several** production facilities,
  - **combined arrangement** of production processes (serial-parallel).

Production structure

1 Parallel arrangement of production

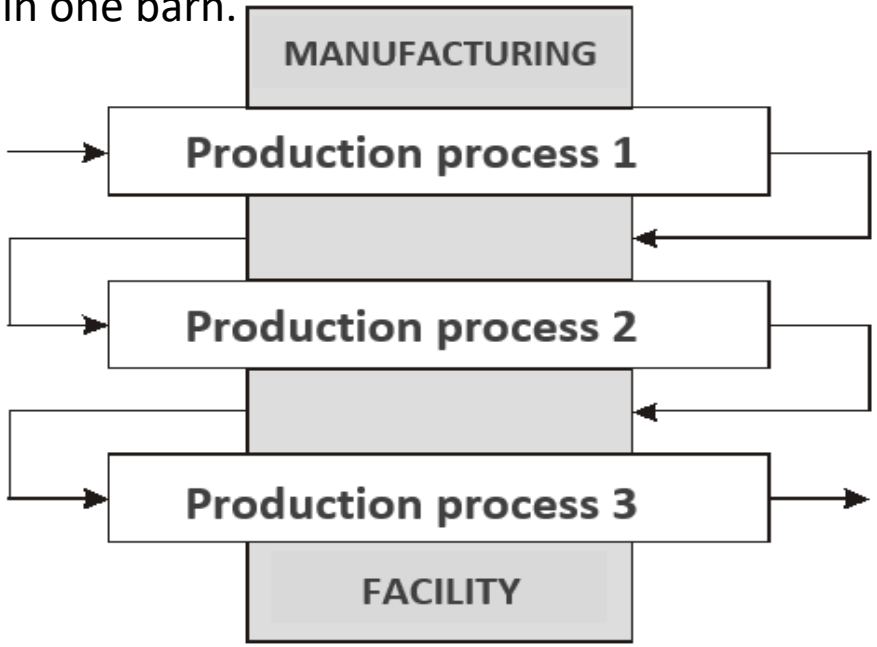
•Parallel arrangement of production processes (side by side) is typical of plant production processes. It is a way of arranging production processes independently of each other in one production facility (i.e. the soil).



Production structure

***2. Serial arrangement of production processes (consecutively) in one production** facility.*

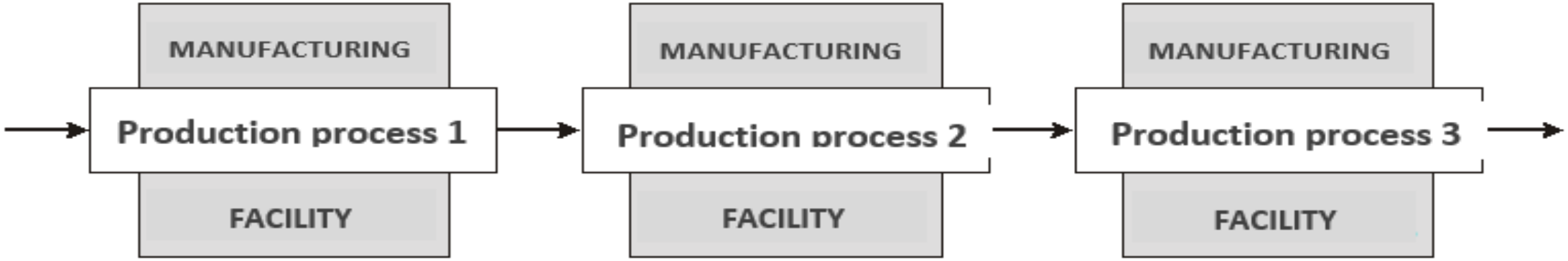
- The essence of this method of arrangement is that the output from one production process is an input into another production process.
- The output from the second production process is, in turn, an input into the third production process in the same production facility.
- This method of arrangement is typical of the production processes of **ordinary livestock** production on private farms or in one barn.



Production structure

3. **Serial arrangement of production processes in several production facilities**

The serial arrangement of production processes (consecutively) in several production facilities is typical for production processes of specialized livestock production (fish farming), which are carried out in large-scale production conditions of several housing facilities:

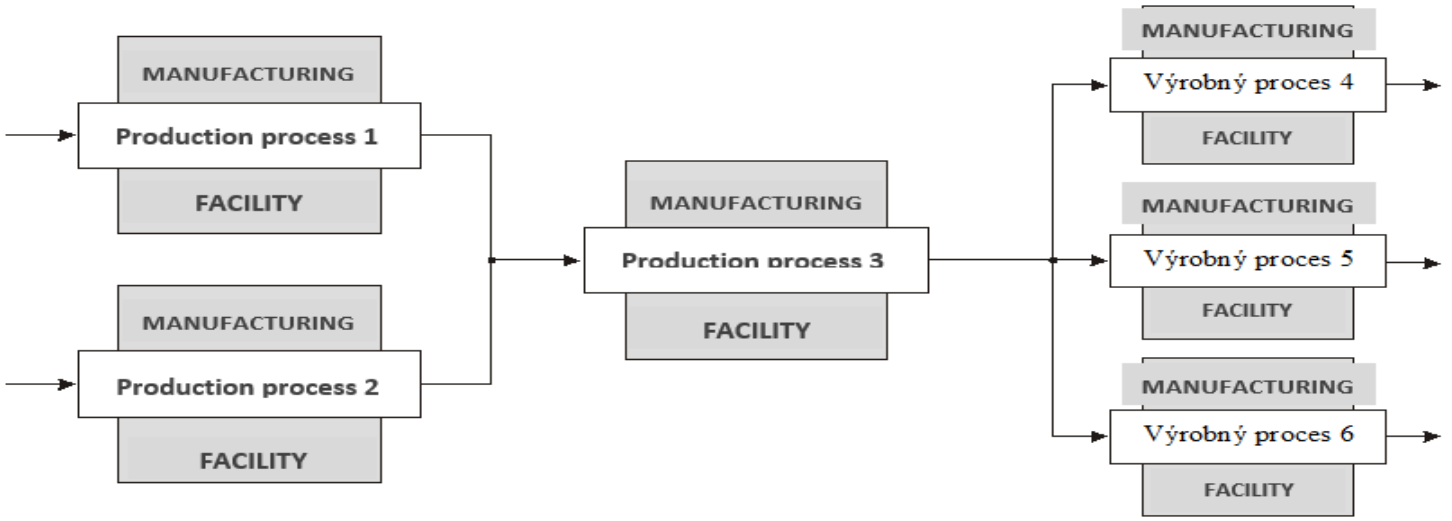


Production structure

4. Combined arrangement of production processes

The combined arrangement of production processes (serial-parallel) is one in which the initial production processes run side by side independently, but other production processes are serially followed.

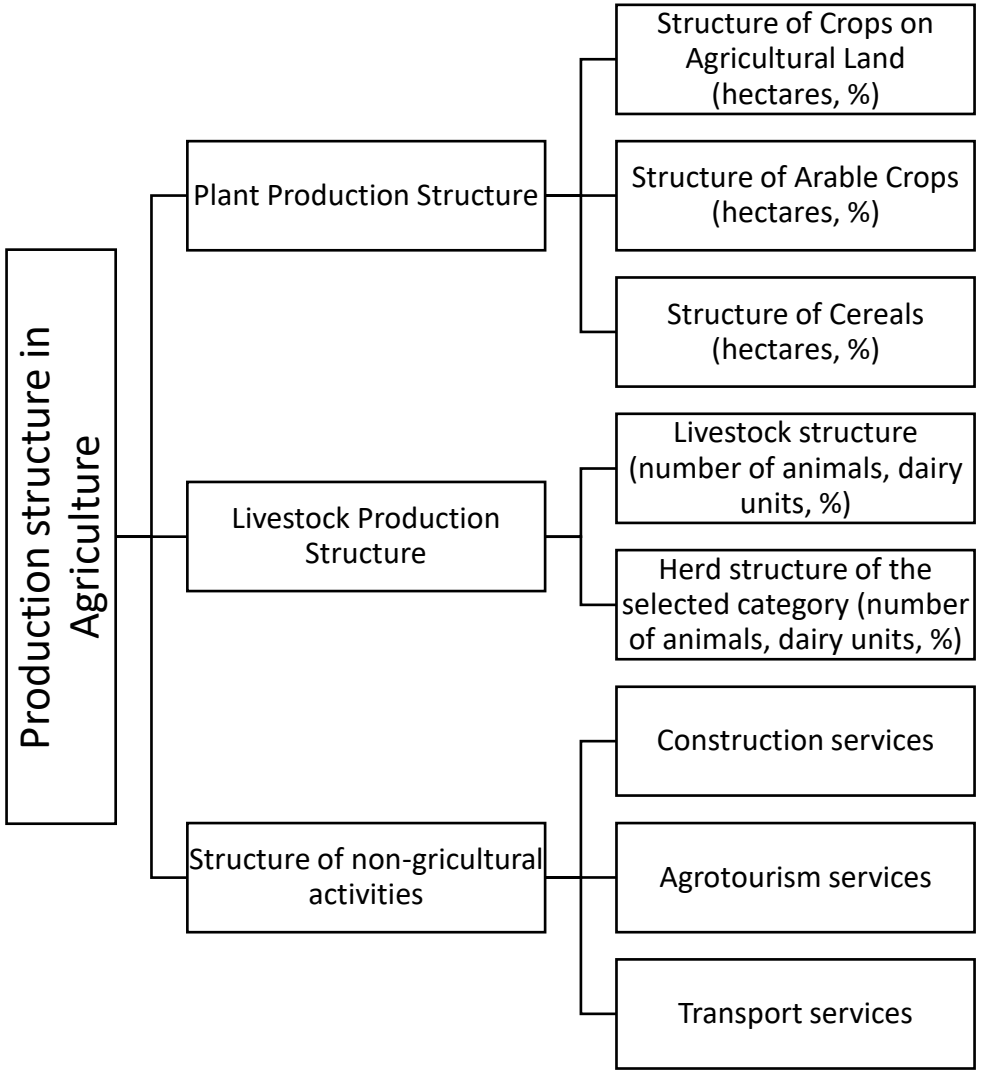
- e.g. the retention of **calves** from two calves and the subsequent transfer to one common fattening house, from where the animals are moved to three other cowsheds after a certain period of time.
- In the past, this type of arrangement of production processes was greatly used in the cooperation **grazing of heifers** between business units from lowland production areas and business units from the foothill and mountain production areas of Slovakia.
- The **aim** was to obtain healthy reproductive material also for the **low-land production conditions** of Slovak farms.



Production structure

- In general, the production structure is a system consisting of a rational representation of the industries and their elements and activities so as to make the necessary profit from a successful business.
- From the production perspective, the production structure represents a system of materially, timed and spatially arranged elements of production in sectors, especially in terms of optimal solution of tangible energy, value and other links in order to create the prerequisites for making a profit.

Composition of the production structure in the primary production agro-subsidy



Factors affecting Production structure

- The production and economic conditions of the entity,
- Results of marketing analyses,
- The level of capital endowment of the entity,
- Efficiency in the use of labor resources,
- Degree of concentration and specialization of production,
- The economic advantage of sectors in relation to a rational system of land management.

Material structure of production

- **The material structure of production** divides production into sub-parts, defines and characterizes their relationships and elements.
- The main criteria of the material structure are:
  - production profile,
  - production program,
  - output elements (products),
  - human participation in the production process,
  - technological processes.

Basic Terms

- The production profile: determined by the structure of long-term tangible assets - depreciated and land fund.
- The production program: made up of the composition of individual productions in the production unit. Most often it is formed by:
  - The **main** production,
  - **Supplementing** production,
  - **Side** production.
-
- Output elements (products) are the result of **individual production processes**, which can be:
  - the main production processes whose products are intended for marketing, excluding the production unit,
  - **auxiliary production processes** - their products and services are necessary to ensure the main production processes. The products of these processes only exceptionally leave the production unit,
  - **service production processes**, provide their services with the main and complementary processes (transport, warehouse).

Basic Terms

- The participation of man in the production process: determined by involvement of the workforce in the production process. According to the connection, we distinguish:
  - **Work processes** in which worker directly acts on the input elements,
  - **Natural processes**, take place without the direct involvement of man. However, they are the basis of biological processes in agriculture,
  - **Automated processes** in which the transformation of a work object takes place only under the control function of a person. That is, without direct action.
- Technological processes are determined by quantitative and qualitative changes of input elements to the resulting products. If there is no change in input elements, so-called non-technological processes (e.g. material handling, quality control, etc.) take place.

Time structure of production

- ***The production time structure*** is made up of a general time distribution of the production of products in the production unit. In particular, it is given by the composition of the intermediate production time of the product concerned.
- The continuous production time consists of a summary of:
  - working,
  - downtime, and
  - technological process times.

- From a time point of view, it depends on:
  - **Seasons.** In livestock production, the **seasonality** of production has been essentially eliminated, which meant a more rational use of workers, tangible fixed assets and production facilities compared to crop production.
  - **meteorological conditions**,
  - **crop demands** for inputs in the different stages of the growing season.

The spatial structure of production

- **The spatial structure of production** includes:
    - the layout of the industries in the territory of a particular production unit,
    - the personal and material factors of production in a particular proposed space, depending on natural, economic and other specific conditions.
- The **aim:** to carry out production with minimum requirements for individual elements of production. The spatial structure of production is influenced by the following factors:
    - the size and shape of the production and business unit,
    - complex situational distribution of land, production, storage and other capacities,
    - production focus of the business unit and its internal units,
    - communication network (main and secondary field roads),
    - deployment of transport, energy, labour and other resources.

Production base in agriculture

- The **agricultural production base**: demarcated area of the land fund of a particular agro-entity or other territorial unit where processes are carried out for the conversion (transformation) of raw materials, materials, semi-finished products, energy and information into the desired products and services with a view to achieving economic prosperity.
- From a corporate and production point of view, the **production base** is made up of a **set of elements**, i.e. workers, factors of production (resources) and input elements arranged in a particular functional space, which aim to produce products and provide services in order to meet market needs and make a profit.

Production base – basic terms

- The **content** of the production base is the rational arrangement of its social and factual elements over time and space so as to achieve maximum production of the desired products (activities) with a relatively minimal consumption of resources and production elements.
- The function of the production base is the **production processes** and, conversely, the production processes are carried out by the production base itself.
- The development of the production base is closely related to the development of sources and elements of production, scientific and technological progress, the further development of which is conditioned by the form of ownership, production, natural- climatic and economic conditions.

Production base

- **The scope, nature and structure of the production base** are determined by:
  - the **types** of elements (agents) of production,
  - the **quantity** of elements (factors) of production,
  - the **relationships** of the elements (agents) of production,
  - **performance** of production elements(s),
  - **efficiency** in the use of elements.

- The scope of the production base can also be measured by the amount of own production.

Forms of Production base

- **The production base is organized in <u>various forms</u> of agricultural production.**
- **The most common are:**
  - agricultural cooperatives,
  - public and public-benefit farms,
  - public limited-liability companies,
  - self-employed farmers,
  - commercial and public limited companies,
  - manufacturing and trading companies,
  - trading companies,
  - other forms of production organization.