



EXPORT POTENTIAL

OF THE CZECH TRADITIONAL
AGRI-FOOD TECHNOLOGIES



MINISTRY OF AGRICULTURE
OF THE CZECH REPUBLIC

Introduction by the Minister

Dear Business Partners, Dear Readers,

Allow me to present to you the publication *Export Potential of the Czech Traditional Agri-food Technologies*, which is a follow-up to the brochure *Export Potential of the Czech Traditional Agri-food Products* that together present a full range of Czech products in the sector of agriculture and food processing.

The industrial production is deeply rooted in the territory of the Czech Republic. At the times of Austro-Hungarian Empire, the Bohemian lands constituted the industrial base of the region and just before the Austro-Hungarian Empire downfall roughly 70 % of the industrial production of the entire monarchy was concentrated in the Czech lands. Even today the industry in the Czech Republic represents an important sector of the Czech economy, to be specific approximately 35 %. The main pillars of the Czech industry are the engineering, metallurgical, chemical and food processing sectors.

And it is the quality and history of the Czech mechanical engineering which is, thanks to the production of innovative and affordable technologies, crucial for the sector of food processing and agriculture. It is taken for granted that our facilities comply with the most stringent technology, safety and hygiene standards applicable not only in the EU Member States but also in other countries.

The Czech Republic has a long-lasting tradition in the production of many world-known agricultural products and foodstuffs (e.g. beer, wine, liquors or cheese). The gradual improvement of quality of production necessitated also the development and upgrading of production technologies, thus the Czech Republic can now pride both in the production of top-notch machinery and in the deep knowledge of production procedures. The producers are not only technology giants, but also many small and medium-sized enterprises that have the expertise to design the overall implementation of a technology unit and to deliver it as a turnkey

project. There are also companies in the Czech Republic which can accomplish partial tasks and add the individual components or technological elements into the already existing and functioning lines based on the specific needs of the respective customers. Ranking among the leading Czech export products in this field are for instance equipment and facilities for breweries, mini breweries, wine production, industrial distilleries and grower distilleries, dairy factories and cheese factories, packaging lines and cooling technologies.

The Czech Republic's flagship are particularly the deliveries of agricultural machinery, whether it concerns the traditional Czech production of Zetor tractors, or small tractors or soil preparation and tillage machinery and equipment. Last but not least, the Czech Republic is most successful in delivering investment units for animal production such as pig houses, cow houses, poultry farms, or aquaculture technologies.

In terms of territory, the Czech exports are therefore directed primarily to the Eastern Bloc countries, countries of the former Soviet Union and Yugoslavia. Nonetheless, in recent years the Czech exports are ever more often destined also for more remote destinations such as Mexico, Uruguay or Ethiopia.

Dear businessmen, farmers and processors, I am firmly convinced that just as the Czech producers are competitive with their top quality and affordable agricultural products and foodstuffs, also in the related field of technology and equipment the Czech Republic can offer a wide portfolio of top-ranking products for all processes of the given production sector. I will be happy if this publication provides you with useful information, contacts and helps you enhance the awareness of and demand for the Czech production.



Marian Jurecka
Minister of Agriculture of the Czech Republic

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I. Agricultural Machinery and Technology





I. Tractors

The use of tractors has had a long-lasting tradition in the Czech lands. The beginning of industrial large-scale production dates back to the period after World War II, when there were several manufacturers in the market. The modern history of tractors is closely linked to the Zetor brand, which is the only company producing tractors in the Czech Republic continuously ever since 1946. Since then it has become renown all over the world, 90 % of the total production is exported and the brand keeps building its position in the domestic as well as the world market.

These tractors are characterised by their versatility, their four model lines can satisfy all potential customers. They are designed for work under difficult conditions, have a good price-to-power ratio, they are easy to operate and maintain, fuel efficient and offer optimum performance. Moreover, their long life has traditionally been guaranteed.

The manufacturer responds to the needs of customers and focuses on increasing the power – currently Zetor tractors offer 50 to 160 horsepower, and also seeks to further extend the product range towards higher horsepower tractors.

It is also necessary to mention and appreciate the balance between the simple construction enabling longer life and lower failure rate on the one hand and the state-of-the-art technologies simplifying the operation on the other hand. The key advantages of the Czech tractors are the following: power (thanks to the combination of powerful engine and higher weight), endurance (thanks to their elegant, simple and robust construction) and efficiency (low fuel consumption and low operating costs). The combination of these features represents the main competitive advantage of the Czech tractors.

2. Small tractors and small machinery

The Czech companies produce small tractors of all types: single axle small tractors with diverse modifications, dual axle small tractors ranging from the model with front wheels drive to articulated versions, versions with a rotating seat, with or without a cab, and offered are also versions adapted for work in forest or on the slopes.

This machinery also requires specific implements, a full assortment of which is offered by our producers. These are especially tillage machinery, i.e. ploughs, rotavators, disc tillers, tine cultivators, but also the application equipment, transport and handling equipment, namely trailers, front loaders or backhoes or pallet forks, which can substantially improve the versatility of their use.

Another advantage of small tractors is their potential use in the community. Therefore, the producers offer also special machinery for the upkeep of gardens, playing fields and roads such as various types of mulching machines and mowers, boom mowers, machines for winter road maintenance such as snow blades, snow cutters, sweeping brushes, spreaders and other usual communal machinery.

The Czech producers offer functional and sophisticated machinery, which in its price and performance categories always offers a number of exceptional features as against the comparable machinery of other brands, they seek to create top quality products that guarantee a long lasting and good service, while being consistently sold at a reasonable market price.





3. Machinery for soil preparation and tillage

In crop production tillage belongs to the most energy intensive and economically demanding working operations. Apart from conventional approaches based on the annual mouldboard ploughing also no-till and minimum tillage technologies or strip-till farming are gaining ground.

The top-notch Czech agricultural machinery makes it possible to select the sophisticated tillage technologies suitable for the given soil and climatic conditions and the farming methods applied by the agricultural holding. The ambition is by means of machinery to achieve the tillage in the most efficient way with the highest daily output and at minimum costs.

These requirements determine the direction of the future development of machinery, i.e. combining multiple tillage operations into

a single trip at the required speed with the minimum fuel consumption and extending the working width.

The Czech machinery producers offer a broad assortment for all the applied technologies and continuously innovate and adapt their offer in line with the latest knowledge. Moreover, they also enhance the versatility, range of working width of machines and offer numerous optional attachments. Hence, the farmers can adapt the product easily to their own requirements and local natural conditions. The products are made of the best materials satisfying the requirements for quality and endurance of machines in particular. Development, production and sale of technology are certified as compliant with the European standards.

4. Animal housing technology and animal production technology

Animal housing technology and animal production technology belong to the most important segments of the Czech export. The most up-to-date equipment manufactured in the Czech Republic with a high utility value enables to reduce the share of labour, improve the regularity and quality of care for animals. It also improves the environment of animals and contributes to achieving higher and long-term performance and profitability of cattle, sheep, goat, poultry or fish farms.

In order to achieve the requested efficiency, it is not enough to keep the animals in houses (stalls) fitted with state-of-the-art technologies in high densities. Of equal importance for high productivity is the genetics of the kept animals and their good health status. Among the prerequisites of top quality production is the appropriate standard of herd management, high quality animal care,

adequate degree of their comfort, modern breeding procedures, top quality rearing of young animals and professionally supplied nutrition in the form of quality feeding stuffs in well balanced feed rations.

It is the continuously expanding portfolio of products and services which contributes to the economic stability of our companies. The Czech manufacturers of animal housing technologies avail of strong and professionally competent teams of specialist-designers, including design engineers who are capable of drawing up project documentation for all stages of the process, carrying out the environmental impact assessment, providing advisory services, helping obtain financing, arranging for deliveries of technologies and their assembly, delivering turnkey projects, ensuring warranty and post-warranty services as well as subsequent deliveries of feed-stuffs.





5. Aquaculture technologies

The worldwide fish consumption for the rapidly growing human population has been consistently increasing year-on-year. Therefore, in the last 50 years the freshwater fish breeding became the world's fastest growing animal production sector with the annual increase in production accounting for about 8 %. The aquaculture contributes by almost fifty percent to the world production of fish for human consumption.

The Czech producers offer a broad spectrum of fish breeding technological units, equipment and accessories for intensive aquaculture, recirculating (closed) systems in particular. The offer comprises technologies for fish rearing (fish egg incubation apparatuses and round tanks for fish rearing), for fish transport, filtration systems, oxygen mixers or UV boxes. Offered are also automatic feeding technologies used in many EU Member States for salmon rearing through the

early life stages and for trout and char farming. It is a fully automated computer-controlled system which saves human labour and achieves optimal feed conversion. A high return on investment is guaranteed.

All the used materials are certified for contact with drinking water, especially the construction PP, PE and PVC materials of all types, quality and colour shades. However, even the specialised production of customised stainless steel products does not constitute any problem whatsoever.

The quality of these products is proven by the fact that the Czech Republic ranks among the world leaders in breeding and exporting of ornamental fish. The Czech producers have been well-known for their know-how, tradition and good repute in this sector for more than one hundred years.

6. Forest technology – cable (logging) systems

An environmentally-friendly transport of logs from the forest stand means such a transportation which reduces or avoids pulling logs on forest soil surface, i.e. partial- and full- suspension logging systems. These parameters are met by the cable logging technologies manufactured by Czech producers. Forest cable logging systems thanks to their versatility can be operated and used not only in hilly areas, but also in impassable flat terrains such as marshy soils, peat bogs, places with bulky stones and rocks, etc.

The present-day modern forest cable systems usually include a radio control for the operator, which reduces the risk of damage to the surrounding stand to minimum and safeguards the safety of the operator himself. Another aspect of the modern-day cable systems is the automatic ride on a load bearing cable, which facilitates an independent movement of the carriage between any two selected points.

Yarding the logs by forest cable systems has many significant environmental advantages compared to the use of tractors. The require-

ments for the road network density are much lower (in case of cable yarding the road spacing is 800 to 1000 m, in case of tractors it is 100 m). When the cable systems are used, the forest soil is not damaged by compaction, rutting or other disturbances. There are also major energy and weight savings achieved. The weight of the cable system carriage, which is capable of pulling roughly the same load on a load-bearing cable as a universal wheeled tractor, represents just a few percent of the tractor's weight. Consequently, these and other advantages help preserve the legacy for future generations.

The Czech forest cable systems are used in many different parts of the world (e.g. in Slovakia, Ukraine, Poland, Hungary, Spain, Russia or Columbia) and comply with the statutory and safety EU legislation.







II. Food Processing Technology

I. Technology for breweries and minibreweries

The beer production and the brewing right has had a long-lasting tradition in the Czech lands (the first reference to the brewing of Czech beer is comes from Břevnov Monastery and dates back to the year 993). The Czech Republic, known as the leading beer world power and the country with the highest consumption of this gold coloured drink per capita, has also developed top-notch brewing technologies that are exported to various corners of the world.

The Czech manufacturers of technologies for breweries and minibreweries offer either the delivery of brand new technology units, or arrange for the reconstruction and upgrade of the existing technologies. They provide tried and tested equipment and technology solutions for malt mills, brewing houses, wort

cooling and fermentation, beer maturing, and auxiliary technological sets. The technology and equipment for the whole brewery is delivered together with fully automated solutions based on the cutting-edge computer-aided management and information systems. The manufacturers are able to closely cooperate with the customer and to provide customised solutions perfectly adapted to the customers wishes, tastes and requirements.

Due to the importance of beer in the Czech Republic there is the Research Institute of Brewing and Malting, which at its workplaces in Prague and Brno explores new methods of malt and beer production and looks into the technological processes and development of the related production and analytical methods.





2. Wine making technology

Wine making has had a very long tradition in the Czech Republic. The first references to wine growing in Moravia date back to the beginning of the 9th century and in Bohemia to the beginning of the 10th century, which is proven by many archaeological finds of tools used for viticulture as well as by the preserved written documents with references to these areas. Thus, over one thousand years the wine growing and wine making tradition in the Czech Republic has been shaped, thanks to which the Czech and Moravian wines as well as wine making technologies are export items in high demand. The technological procedures differ not only from region to region, but also from winery to winery. It is always up to the wine

grower or wine maker whether he prefers the conventional production or state-of-the-art technologies. The basic winemaking rules and procedures, however, remain unchanged.

Thanks to the centuries long experience, development and time-proven procedures the Czech producers have become the manufacturers of top quality and sought-after wine-making technologies, both for small wine-makers and large-scale producers. The portfolio of products offered by Czech producers includes grape reception lines, wine-filtering technology, containers, barrels, vinificators, technologies for controlled fermentation and wine storage, and many others.



3. Technology for sugar mills

The tradition of sugar industry in the Czech Republic is almost 200 years long. The first sugar mill was established in Kostelní Vydří near Dačice in 1828. The golden age of Czech sugar industry is considered to be the 19th and 20th century, which marked the development of sugar industry and food engineering in the territory of the today's Czech Republic.

An important period for sugar industry was the second half of the 20th century, with the boom of construction of sugar mills in the Czech Republic and abroad. In the period from 1880 to 2005, a total of 217 Czech sugar mills was built on various continents (155 in Europe, 50 in Asia, 7 in Africa, 5 in South America). The equipment and whole sugar mills including "human resources" (chemists, technicians, mechanical engineers, etc.) were exported to 4 continents and more than 40 countries, particularly the Third World countries – among others also India,

Pakistan, Burma, Sri Lanka, Indonesia, Cambodia, Iran, Syria, Egypt, Sudan. etc. Almost two centuries of experience and development brought the Czech producers to the top both in sugar production and development of sugar technologies.

The Czech experts provide also expert, consultation and project design activities for sugar industry concerning balance calculations, modernisation of plants or increase in production capacity, including the preparation for constructions and assemblies. The new technologies are fitted with a modern control system, which apart from the control of production and auxiliary processes and their visualisation, archiving of operational data also keeps the laboratory log and monitors sugar production from the purchase of raw materials to the final product. The training of staff is naturally also provided.

4. Technologies for fruit distilleries, grower distilleries and industrial distilleries

The tradition of Czech distilling industry dates back to the 14th century when the first distilleries emerged. The first Czech distillery in that century was the wine distillery in Kutná Hora. The quality of products has gradually improved together with the development and modernisation of technology, thanks to which the Czech Republic can now pride in the manufacturing of top-notch lines and know-how in distilling industry. Production and export of the Czech brand herbal liquors and fruit spirits in particular have had a long-lasting tradition in the Czech Republic and the Czech spirits and herbal liquors are renown far beyond the Czech borders.

Nevertheless, it does not apply only to technologies for production of alcoholic beverages, machines of the same quality are manufactured also for industrial and agricultural distilleries and other types of production by

fermentation (biogas, microbial enzymes, medicinal products, etc.).

The Czech producers provide designs and optimisation of production technologies, technical assistance in assessing process parameters of facilities for the sake of increasing capacity and efficiency of production and quality of products. They are capable of submitting proposals for a suitable use of by-products and wastes of the manufacturing process. Production control systems and alcohol circulation systems compliant with the applicable legislation are offered to distilleries, namely both for food processing and biofuel manufacturing. Delivered together with production technologies and related processes are also comprehensive computer management and information systems.



5. Technologies for dairy plants



The first dairy in the territory of the today's Czech Republic was established in 1870s in Hostivice near Prague and around 1900 there were already over 85 dairy cooperatives. The Czech milk production is the synonym for top quality. For bulk milk collection and reception, its treatment and processing

the high-techs are used, which guarantee top quality and health safety. Almost two centuries of gradual development and modernisation helped the Czech producers to become the leaders in technologies for dairy industry.

The Czech producers deliver to the dairy plants the technological units or their parts, namely from reception and processing of raw milk through heat treatment of milk and cream and production of other products up to distribution. They also arrange for reconstructions and upgrading of the existing facilities in order to increase the efficiency and energy performance of the manufacturing process and to achieve consistent and high quality of products. The deliveries include an advanced computer management and information system, the design and features of which are the result of close cooperation with the customer. The Czech producers are able to deliver technologies to all parts of the world.

6. Cooling technologies

The cooling technologies are used by almost all food processing plants such as meat smoking facilities, slaughterhouses, prepared food plants, canteens, meat and milk pro-



cessing plants, sandwich production, production of beverages, but also in supermarkets, etc. The overwhelming majority of cooling is direct which means that the cooling agent is vaporized directly in individual vaporizers located in the cooled spaces (e.g. showcases, cooling boxes, working premises, etc.).

The Czech producers fulfil all kinds of orders, from small coolers and freezers, reconstruction of the existing plants, customised cooling technologies up to the construction of brand new technological units, always bearing in mind the energy savings, high efficiency and environmental friendliness.

For the sake of reducing energy intensity and economy of the whole process, it is pivotal to appropriately design and faultlessly install

the whole cooling technology. One of the options conducive to savings is e.g. the so-called recovery, i.e. the heat recovery. The heat obtained from the cooled equipment is thus instead of merely dissipating into the surroundings recovered and used for domestic hot water heating or heating of premises.

The Czech producers offer quality technologies for commercial cooling, cooled storage and freezer rooms, food processing and manufacturing industries, industrial applications or cooling of production and technological premises.

7. Packaging lines for food industry

The Czech producers offer a broad portfolio of food packaging machinery – from simple standard machinery to fully tailor-made turnkey solutions. One can choose from semi-automatic and automatic packaging machine used in a wide spectrum of food processing involving all kinds of food.

Offered are horizontal packaging machines, vertical packaging machines, packaging machines for packing into flat bags, machines for packing in heat-shrinkable film, packaging

lines, dosing equipment, bag sealers, automatic dosing scales, conveyers, vacuum packaging machines for food.

The packaging lines are often supplemented with conveyor lines, handling systems, marking and labelling equipment, control and safety elements, which together reduce the number of operations performed by man to the minimum. Each packaging line is unique, designed and assembled to meet exactly the needs of the specific plant.



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