Fifty years of Hurbanovo maltery
Pát’desiat rokov hurbanovskovej sladovne

Tomáš KRAJČOVIČ
Heineken Slovensko Sladovne, a.s., Novozámocká 232/2, 947 01 Hurbanovo, Slovak Republic
Heineken Slovensko Sladovne, a.s., Novozámocká 232/2, 947 01 Hurbanovo, Slovenská republika

email: tomas.krajcovic@heineken.com

Reviewed paper / Recenzovaný článok

---

**Keywords:** maltery, 50° anniversary, malt, Hurbanovo

---

**1 INTRODUCTION**

Even in a life of such a large company like Heineken Slovensko, there is something about every year that is extraordinary and special. For the largest brewing and malting complex in Slovakia, 2017 was an important milestone year – it was the 50th anniversary of Hurbanovo maltery. In April it was exactly half a century since construction work was completed, and in October it was 50 years since the first tonnes of Hurbanovo malt had been produced. The maltery was then a part of the state-owned enterprise Západoslovenské pivovary a sladovne, Bratislava. Once everything was completed, the maltery consisted of 64 steeping tanks, 16 Wanderhaufen system lines and four double-floor kilns. The planned malt production capacity of 30,000 tonnes was already achieved in 1968. Organisational change in 1984 caused the creation of the separate state-owned enterprise Zlatý Bažant, Hurbanovo. After the new germination facility with eight Saladin boxes and two single-floor kilns were built and at the same time the steeping process was adjusted, the annual production capacity of maltery increased during 1986 and 1987 to approximately 63,000 tonnes of malt. In 1992, the brewery was transformed into a joint-stock company Zlatý Bažant and in 1995, the whole plant became a part of the Dutch company Heineken. In 1998, a new steeping room with nine cylindroconical steeping tanks took the place of the old steep tank system. Following adjustments of the technological process enabled the increase of total malt production capacity to 80,000 tonnes annually. Another organisational change happened in 2001, when maltery became an independent joint-stock company under the name Heineken Slovensko Sladovne. In 2002, there was a modernization, an increase in the capacity of six steeping tanks, a construction of six new circular germinating boxes and high-capacity single-floor kiln, thus extending the maximum annual production capacity to 150,000 tonnes. At the same time, the malt production in the outdated Wanderhaufen system floors and four original double-floor kilns was discontinued. The old Saladin boxes and two single-floor kilns were decommissioned gradually during 2012 and 2013. With an annual malt production capacity of around 111,000 tonnes, the maltery is the largest not only in Slovakia, but also in the entire Central Europe.

---

**Keywords:** sladovňa, 50.výročie, slad, Hurbanovo

---

**1. ÚVOD**

Každý rok je niečim výnimočným a špecifickým, a to aj v živote takovej veľkej spoločnosti ako je Heineken Slovensko, a. s. Rok 2017 sa v najväčšom pivovarsko-sladovníckom komplexne na Slovensku niekoľko rokov od výroby prvého tonu sladu nielen v znamení dôležitého miľníka – 50. výročia založenia hurbanovskej sladovne. V apríli totiž ubehlo presne polstoročie od ukončenia stavebných prác a v októbri to bolo 50 rokov od vyrobenia prvých ton hurbanovského sladu. Sladovňa bola v tých časech súčasťou podniku Západoslovenské pivovary a sladovne, n. p. Bratislava. Po skompletnovaní všetkých objektov a zariadení mala sladovňa 64 náduvníkov, 16 linek posuvných hromád a štyri dvojolieskové hvozdy. Plánovaná výrobná kapacita sladovne 30 000 ton bola dosiahnutá už v roku 1968. V roku 1984 došlo k organizačnej zmene a vznikol samostatný národný podnik Zlatý Bažant, Hurbanovo. Po skompletnovaní nového klíčiara s čím sa totiž stalo sladovňa najväčšou na Slovensku i v regióne celej strednej Európy.

---

**Kľúčové slová:** sladovňa, 50.výročie, slad, Hurbanovo
**2 CONSTRUCTION AND BEGINNINGS OF THE MALTERY**

The cornerstone of the complex was laid on November 1, 1964, in the midst of the era between 1957 and 1974 when the Slovak Republic saw a massive boom in the construction of breweries and malteries (Anonym, 1996). At that time, the construction of six new large-capacity breweries in Topoľčany, Rimavská Sobota, Veľký Šariš, Hurbanovo, Banská Bystrica, and Trnava was completed.

Construction was completed on April 1, 1967, with the plant in Hurbanovo being created as a part of the state-owned enterprise Západoslovenské pivovary a sladovne, Bratislava (Západoslovenské pivovary a sladovne, 1967). It was part of the production-economic unit (PEU) Pivovary a sladovny, odborové riaditeľstvo, also based in Bratislava.

The brewery went live two years later with an annual production capacity of 600,000 hectolitres (Anonym; 1979; 1996). The first manager of the Hurbanovo plant was Ján Riman, who in 1964, as the construction engineer, laid the foundation and then oversaw the construction of the brewery as well as the brewery. He remained in the manager position until the end of his career in 1990.

The primary suppliers of machinery for the brewery and maltery were the trade union enterprise CHEPOS, plant Hradec Králové and the state-owned enterprise Strojírny potravinářského průmyslu, Hradec Králové, plant Olomouc. The construction work was carried out by the state-owned enterprise Stavoindustria, Bratislava. The silos and buildings for barley intake were the first to be commissioned.

The plant launched a campaign for the 1967/68 season with the purchase of 10,001 tonnes of barley on July 1, 1967 and one by one opened the facilities for barley intake and cleaning (Západoslovenské pivovary a sladovne, 1967). Once everything was in hand, the brewery went live two years later with an annual production capacity of 30,000 tonnes.

One of the malteries first employees, who stood at its birth, were many people of the technical and production staff. Some of them were trained on Wanderhaufen system floors and kilns of other malteries in Topoľčany and Michalovce. Subsequently, they were joined by graduates of the erstwhile brewing and malting vocational school in Topoľčany who participated in the plant’s inception as apprentices in their last year of school and helped get the maltery up and running. After they had completed their studies and training to be maltsters and brewers, they were immediately employed by the maltery as of July 1, 1968 and began putting their theoretical knowledge and skills into practice.

### 2.1 First Tonnes of Malt

The steeping line began production on October 9, 967, producing 5.6 tonnes of steeped barley. After 66 hours of steeping, the Wanderhaufen system was filled on 12th October and the first malt was produced on 21st October of the same year.

Production was often affected by machinery malfunctions, which was mainly reflected in the lack of melting cycle uniformity. Issues with supplies of auxiliary materials and spare parts were resolved with cooperation with the above-mentioned machinery suppliers of the enterprise. Another thing to keep in mind is that malt production took place with workers, many of whom had no knowledge of the specific procedures or production processes until the actual production process was under way (Západoslovenské pivovary a sladovne, 1968). Despite all the difficulties and the delayed commissioning of the production facilities, the production plan for 1967 of 4,500 tonnes was satisfied not only in terms of quantitatively (4,521 tonnes were produced) but also qualitative aspect (Západoslovenské pivovary a sladovne, 1967) (Fig. 1). As early as next year, the production capacity was already 30,000 tonnes of malt per year.

**2 VÝSTAVBA A ZAČIATKY SLADOVNE**

Základný kameň celého komplexu bol položený 1. novembra 1964, teda v čase rokov 1965 až 1974, keď Slovensko zaznamenávalo významné stavby pivovárnych a sladovných hospodárskych objektov (Anonym, 1996). V tomto období bola dokončená výstavba šiestich nových velkokapacitných pivovárov v Topoľčancách, Rimavského a Velkej Sorše, Hurbanove, Banskej Bystrici a Trnave. Práce boli ukončené 1. 4. 1967, keď vznikol závod v Hurbanove ako súčasť podniku Západoslovenské pivovary a sladovne, n. p. Bratislava (Západoslovenské pivovary a sladovne, 1967). Ten bola už súčasťou výrobného hospodárskejho útvarta (VHU) Pivovár a sladovňa, odborové riaditeľstvo, taktiež so sídlom v Bratislave. O dva roky neskôr spustili naplno prevádzku aj samotný pivovar a sladovňa so ročnou výrobnou kapacitou 600 000 hl (Anonym, 1979; 1996). Prvým riaditeľom hurbanovského závodu sa stal Jáno Riman, ktorý v roku 1964 ako stavebný inžinier položil základy a následne riadil výstavbu sladovne ako aj pivovar. V pozícii riaditeľa zotvoril a pôsobil až do konca svojej pracovnej kariéry v roku 1990. Generálnymi dodávatelia strojového zariadenia pivovárov a sladovných boli odborový podnik CHEPOS, závod Hradec Králové a podnik Strojírny potravinárskeho prúdu (1967). Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. O dva roky neskôr spustili závodu prevádzku za začiatku sezóny 1967/68 nákupom sladovného javorového závodu (Anonym, 1996; 1968). Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený. Zabezpečenie závodu hlavnou surovinou prebiehalo včasno uspokojený.
The quality of produced malt was monitored periodically by in-process inspection as well as by overall analytical review conducted by the on-site laboratory. The quality of malt exported abroad was inspected by the Research Institute of Brewing and Malting (hereafter RIBM) in Brno. The most common fluctuations in quality were found mainly in parameters such as moisture, saccharification, colour or mouldiness (Západoslovenské pivovary a sladovne, 1968).

2.2 Production Technology

As long as barley is harvested at the proper time in the proper manner, and well treated and stored, it is very resistant to adverse conditions. When you add to that observance of the basic principles of malting, quality malt can be produced on a regular basis. There was a time, however, when barley was far from this ideal. It was often harvested much too early, and when less suitable steeping or germinating technologies were used, barley like this was far more prone to losing its ability to germinate (Kastner, 1977).

At first, production followed the framework technological procedure developed and adapted to the attributes of the malting barley crop of 1967 (Západoslovenské pivovary a sladovne, 1968).

Fig. 1 Overview of the indicators fulfillment in 1967
Obr. 1 Prehľad o plnení ukazovateľov za r.1967

The initial malt production process used 64 steeping tanks (with a capacity of just under 8 tonnes of barley per tank) with no system for aeration, removing CO\textsubscript{2}, or even for spraying. Steeping time was usually 48 hours, but the line was also adapted for 72-hour recipes. There were three immersions, wet stands outweighed dry stands 2 to 1, and the barley was steeped out to the germinating heaps by wet method.

The grains germinated 6-7 days in Wanderhaufen system floors (Fig. 2) at temperatures between 12 and 18°C, maintained by a flow of fresh and return air. About six hours after steeping, the barley was sprayed for the first time and batches were turned 2 times per day.

Kilning took place in 4 double-floor kilns (Fig. 3) with suction fans, equipped with indirect steam heating. Two of them were for economic reasons reworked for direct heating by gas combustion. However,
the outputs of the gas burners were barely enough and the average performance of the kilns was too low. That was one of the reasons why the kilns mentioned were converted back to steam heating in the late 1970s into the early 1980s.

The original prescribed kilning time was about 12 hours on each floor, with a curing temperature of 80-83 °C. The kilns worked with remote thermometers and temperature recorders, but those were not exactly accurate at that time. Therefore, due to control, the temperatures were measured manually with a mercury thermometer too.

The uneven bed of malt on the lower floors frequently resulted in temperature differences of as much as 12 degrees. Another problem was the uncontrollable fluctuations in the steam pressure, which made maintaining temperatures with steam heating very difficult (Nentwichová, 1974).

In the first years of the malter’s operation, the foundations of cooperation with the RIBM in Brno for continual oversight of malt production, including technical assistance, had already been laid. The dozens of measures recommended to the maltery by the Research Institute of Brewing and Malting resulted in vast improvements in malt production over the decades.

### 3 INNOVATIONS AND ORGANISATIONAL CHANGES

#### 3.1 Before 1995

The original organisational structure remained in place until 1984, on the creation of the separate state-owned enterprise Zlatý Bažant, Hurbanovo. On October 9, 1992, the brewery was transformed into a joint-stock company under the same name (Anonym 1996; 2000).

After the new germination facility with eight Saladin boxes and two single-floor kilns were built during 1986 and 1987, the annual production capacity of the maltery increased to approximately 63,000 tons of malt. The capacity could have been even higher, but it was adapted to the maximum production capacity of the new kilns. At the same time, a new barley intake facility and 18,000-tonne barley storage facility was built too (Anonym, 1996).

A special task report (Vrtělová, 1987) or document from 1988 (Zlatý Bažant, 1988) about the then malt production technology describes very well the cooperation between the maltery and RIBM in Brno.

According to this document, the steeping time was adjusted to 24 hours, with air rests being predominant and with only one immersion in the steep tank. The steep tanks were divided up so that 32 of them were used for the Wanderhaufen system floors and the same number for the Saladin boxes. The steep tanks were also used to spray the barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes.

The original prescribed kilning time was about 12 hours on each floor, with air rests being predominant and with only one immersion in the steep tank. The moisture content of the barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes.

Zmá klíčili 6-7 dni v linkách posuvných hromád (obr. 2) pri teplo-

The uneven bed of malt on the lower floors frequently resulted in temperature differences of as much as 12 degrees. Another problem was the uncontrollable fluctuations in the steam pressure, which made maintaining temperatures with steam heating very difficult (Nentwichová, 1974).

In the first years of the maltery’s operation, the foundations of co-

3.2 Vstup Heinekenu

V roce 1995 se sladovna, jako súčasť akciové spoločnosti Zlatý Bažant, stala členom holandskej spoločnosti Heineken. Tento sve-

3.3 Do roku 1995

Původná organizační struktura pretrvala až do roku 1984, kdy vznikl samostatný národný podnik Zlatý Bažant, Hurbanovo. 9. 10. 1992 se pivovar transformoval na akční společnost pod rovno-

The uneven bed of malt on the lower floors frequently resulted in temperature differences of as much as 12 degrees. Another problem was the uncontrollable fluctuations in the steam pressure, which made maintaining temperatures with steam heating very difficult (Nentwichová, 1974).

In the first years of the maltery’s operation, the foundations of co-

3.1 Before 1995

The original organisational structure remained in place until 1984, on the creation of the separate state-owned enterprise Zlatý Bažant, Hurbanovo. On October 9, 1992, the brewery was transformed into a joint-stock company under the same name (Anonym 1996; 2000).

After the new germination facility with eight Saladin boxes and two single-floor kilns were built during 1986 and 1987, the annual production capacity of the maltery increased to approximately 63,000 tons of malt. The capacity could have been even higher, but it was adapted to the maximum production capacity of the new kilns. At the same time, a new barley intake facility and 18,000-tonne barley storage facility was built too (Anonym, 1996).

A special task report (Vrtělová, 1987) or document from 1988 (Zlatý Bažant, 1988) about the then malt production technology describes very well the cooperation between the maltery and RIBM in Brno.

According to this document, the steeping time was adjusted to 24 hours, with air rests being predominant and with only one immersion in the steep tank. The steep tanks were divided up so that 32 of them were used for the Wanderhaufen system floors and the same number for the Saladin boxes. The steep tanks were also used to spray the barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes.

The uneven bed of malt on the lower floors frequently resulted in temperature differences of as much as 12 degrees. Another problem was the uncontrollable fluctuations in the steam pressure, which made maintaining temperatures with steam heating very difficult (Nentwichová, 1974).

In the first years of the maltery’s operation, the foundations of co-

3.1 Before 1995

The original organisational structure remained in place until 1984, on the creation of the separate state-owned enterprise Zlatý Bažant, Hurbanovo. On October 9, 1992, the brewery was transformed into a joint-stock company under the same name (Anonym 1996; 2000).

After the new germination facility with eight Saladin boxes and two single-floor kilns were built during 1986 and 1987, the annual production capacity of the maltery increased to approximately 63,000 tons of malt. The capacity could have been even higher, but it was adapted to the maximum production capacity of the new kilns. At the same time, a new barley intake facility and 18,000-tonne barley storage facility was built too (Anonym, 1996).

A special task report (Vrtělová, 1987) or document from 1988 (Zlatý Bažant, 1988) about the then malt production technology describes very well the cooperation between the maltery and RIBM in Brno.

According to this document, the steeping time was adjusted to 24 hours, with air rests being predominant and with only one immersion in the steep tank. The steep tanks were divided up so that 32 of them were used for the Wanderhaufen system floors and the same number for the Saladin boxes. The steep tanks were also used to spray the barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes. The steep tanks were also used to spray barley with the installed spraying head, which also created a curve for the Saladin boxes.
3.2 Entry of Heineken

In 1995 the maltery, as a part of the joint-stock company Zlatý Bažant, became a member of the Dutch company Heineken. On 11th October, this world-renowned international brewing enterprise purchased 66% shareholding in the brewery, becoming its majority shareholder while taking over the old maltery facility. Heineken successfully implemented their investment plan and began to increase beer production, which in turn raised the need for pilsner malt. And this is about where the history of the new maltery began (Anonymous, 1996; Bartakovics, 2012). Beginning that year, it underwent extensive modernisation and automation of the entire production process, from the taking of barley to the dispatch of malt, which led to the malt production improvement and to an increase in the production capacity.

In 1998, a new steeping room took the place of the old steep tank system. This new room consisted of only nine cylindroconical steeping tanks, but with a maximum capacity of 45 tonnes of barley per tank. Steeping became an automated process adjusted to 24 hours. The most common process involved two wet stands and one dry stand. Steeping tanks (Fig. 5) contained a central tube for aeration that ran their entire length, an aeration nozzle, and a discharge tube with a sieve. The bottom of the steep was equipped with pipes to drain water and remove CO₂, a water inlet, and an air inlet.

In 2000, with the purchase of the premises of the agricultural purchasing coop Žitňan, the storage capacity of the maltery was increased by approximately 24,000 tonnes. A cooling system was also installed in 2000 for the Wanderhaufen system floors and Saladin boxes, ensuring continuous production even in the warmer months. Following modernisation of the maltery’s technological equipment, the total malt production capacity was increased to 80,000 tonnes annually.

On May 5, 2000, general meeting decided to dissolve the joint-stock company Zlatý Bažant, Hurbanovo and on January 1, 2001 to merge it with joint-stock company Heineken Slovensko.

In 2001, the name of the joint-stock company Hurbanovo Maltings was changed to Heineken Slovensko Sladovne. The second named merge it with joint-stock company Heineken Slovensko, a.s. on June 4, 2001 right after its split off from the joint-stock company Heineken Slovensko.

4 CONSTRUCTION OF NEW MALTERY

The largest investment was the construction of a new maltery with an annual production capacity of 100,000 tonnes of pilsner malt, further toznamy medzinárodný pivovarnícky koncern skúsil dňa 11. októbra spolu 66% akcií pivovaru, čím sa stal jeho majoritným akcionárom a súčasne tak prebral aj starú prevádzku sladovne. Heineken úspešne aplikoval svoj investičný projekt a postupne zvyšoval produkcíu piva, čo si vyžiadało aj zvýšenú potrebu plzenského typu. A tu niekde sa začala písať história novéj sladovne (Anonymous, 1996; Bartakovics, 2012). Od tohto roku prechádza rozsiahlou modernizáciou a automatizáciou celej výroby od príjmu jačmeňa až po expedičnú súladu, čo viedlo ku skvalitneniu výroby sladu a zvýšeniu kapacity výroby.

V roku 1998 nahradiла starú zostavu náduvníkov nová máčiareň, ktorú tvorilo už len deväť cylindro-kónických náduvníkov, avšak s maximálnou kapacitou až 45 ton jačmeňa v jednom. Máčanie sa stalo automatizovaným procesom prispôsobeným na 24 hodín. Najbežnejší postup bol rozdelený na dve mokré a jednu suchú fázu. Náduvníky (obr. 5) boli v strede po celej dĺžke vybavené rúrou na hlavné prevzdušňovanie, prevzdušňovacím prstencom a splavkovou rúrou so sitom. Dno náduvníka bolo opatrené potrubím na vypustenie vody a zároveň odsávanie CO₂, potrubím na dopušťanie vody a ďalším na prívod vzduchu.

V roku 2000 došlo kúpou priestorov polhodinného Žitňan k rozšíreniu skladovacích kapacit sladovne o približne 24 000 ton. V roku 2000 bolo tiež nainštalované chladienie na posuvných hromadách a Saladinových skriniach, čím sa zabezpečila kontinuálna výroba aj v tlepejších mesiacoch. Po zmodernizovaní technologických zariadení sladovne sa tak celková kapacita výroby sladu zväžila na 80 000 ton ročne. Valná zhromaždenie spoločnosti rozhodlo dňa 5. 12. 2000 o zrušení spoločnosti Zlatý Bažant, a.s., Hurbanovo a dňom 1. 1. 2001 o jej zúčlenení do obchodnej spoločnosti Heineken Slovensko, a.s.

V roku 2001 dochádza ku zmene názvu firmy Hurbanovo Maltings, a.s. na Heineken Slovensko Sladovne, a.s. Druhá menovaná vznikla ako samostatná akciová spoločnosť dňa 4. júna 2001, a to odôdle-
Nová prevádzka zahrádla nielen technologické časti, ale aj moder-
nej administratívne priestory pre operátorov, oddelenie nákupu jač-
meňa, predaja sladu a laboratórium. Realizácia stavby a technologie si
vyžiadała viac ako 700 miliónov slovenských korún (Bartakovics, 2012).

Kdeže bola nová máčiareň skonštruovaná len pár rokov predtým,
nedoslo k budovaniu ďalších priestorov, ale len k rozšíreniu kapacity
už fungujúcich náduvníkov. Tri náduvníky s pôvodnou kapacitou na-
dále slúžili ako jedna zámerka pre staré Saladinove skrine. Maximálna
kapacita sa pri zvyšých šiestich náduvníkoch zvyšila
na 62 ton jačmeňa, ktoré v súčite predstavujú jednu zámerku na no-
verybudované Saladinove kruhové klíčiace boxy. Využíval sa tu po-
stup na dve mokré a dve suché fázy a z technologických dôvodov sa
tie zmenila doprava námocného jačmeňa z mokrej na suchú.

Kličenie prebiehalo naďalej v starých Saladinových skriniach a
po novom už aj v šiestich nových kruhových boxoch. Tie sídla
v dvoch sladovníckych vežiach, na prízemí ktorých sa nachádzajú aj
cancelérie a laboratórium. Zároveň bola v septembri 2002 odstavená
výroba sladu na zastaraných posuvných hromadách.

Na začiatku kličenia je jačmeň dopravený z náduvníkov do klíčia-
cich boxov, kde zmá klíčia päť dní. Nové skrine (obr. 8) predstavujú
kruhový priestor s priemerom 27,5 m, ktorého podlaha pozostáva zo
síť umožňujúcich prístup vháňaného chladného vzduchu do celého
objemu skrine. Na boku kruhovej stény nad sitom je umiestnená do-
pravná kolajnica slúžiaca ako vodiace zariadenie pre kolesá plniace
objem skrine. Na boku kruhovej stény nad sitom je umiestnená do-
priemernú šaržu jačmeňa o veľkosti 360 ton dokáže hvozd vysušiť
prázdňovanie hvozdu je zabezpečované strojovým zariadením.

Stavebnú časť (budovy) realizovala firma Doprastav, a. s.

4 VÝSTAVBA NOVEJ SLADOVNE

Najväčšou investíciou bola výstavba novej sladovne s ročnou ka-
pacitou výroby 100 000 ton sladu pivenského typu, čím došlo k roz-
šiereniu maximálnej ročnej výrobné kapacity až na 150 000 ton. Po
rozhodnute vedenia spoločnosti sa začalo s jej výstavbou na jas
2001 a už v októbri 2002 sa v predstihu spustila výroba sladu (obr. 6 a
7). Sladovňa bola z dôvodu skladovacích a manipulačných priestor-
rov vybudovaná za rekordne krátky čas v blízkosti starej prevádzky.

Fig. 7 New malthery opening in October 2002
Obr. 7 Otvorenie novej sladovne v októbri 2002

the increasing maximum annual production capacity to 150,000
 tonnes. Following the decision of management, construction began in
the spring of 2001 and was completed ahead of schedule, allowing
malt production to launch in October 2002 (Fig. 6 and 7). The malthery
was built in record time near the old plant, due to storage and han-
dling premises.

The construction was realised by the joint-stock company
Doprastav Bratislava, while company Bühler AG (Anonym, 2003)
supplied the technological equipment in cooperation with NEREZ
KONTRA Ltd. SPHEL-PROCONT Ltd Prešov provided the full auto-
mation of production.

The new plant included not only the technological areas, but also
new modern offices for operators, for barley purchasing and malt
sales department, and a laboratory. The entire investment amounted
to over 700 million Slovak crowns (Bartakovics, 2012).

Because the new steeping house had only been built a few years
before, additional premises were not built while the capacity of the
existing steeping tanks was increased instead. Three steeping tanks
with their original capacity continued to serve as one steeped barley
batch for the old Saladin boxes. For the remaining six steeping tanks,
maximum capacity was increased to 62 tonnes of barley, the total of
which represent one steeped batch for the newly built circular germi-
ation boxes. A regime of two wet stands and two dry stands was
used, and for technological reasons the transfer of steeped barley
was changed from wet to dry.

Germination continued to take place in the old Saladin boxes, and
then also in the six new circular boxes. These are contained in two
malting towers, in which the ground floor also contains offices and
a laboratory. Malt production in the outdated Wanderhaufen system
floors was discontinued in September 2002.

At the start of germination, barley is transferred from the steeping
tanks to germination boxes, where the seeds germinate for five days.
The new boxes (Fig. 8) are round with a diameter of 27.5 metres and
have mesh floors that allow cool air to be blown throughout the entire

Fig. 8 Filling of the new Saladin fermentation box
Obr. 8 Plnenie klíčiaceho boxu novej Saladinovej skrine
Spolu s ním hviezdičkou nadále prebiehal aj na dvoch starých jednolískových hviezdoch zo roku 1986. Pôvodné štyri hviezdy, ktoré boli súčasťou najstaršej sladovne, však boli odstavené.

V tejto podobe sladovňa fungovala 10 rokov, počas ktorých vyrábal viac ako milión ton sladu pre domácu aj zahraničnú pivovar.

Bez výroby bola počas tejto dekády len 60 dní, aj to z dôvodu vysokých zásob sladu a opravy regulácie stanice plynu (Bartakovics, 2012).

Počas rokov 2012 a 2013 sa z výroby postupne odstavili stále Saladinove skríne a dva staré hviezdy. Vedenie spoločnosti sa k tomuto krok prišlo najmä kvôli technickému stavu budov a zariadení, pričom jednoznačnou prioritou spoločnosti zostala moderná výroba sladu na novej sladovni.

5 SÚČASNOSŤ

Aj napriek poklesu ročnej výrobej kapacity sladovne po roku 2012 na úroveň približne 111 000 ton sladu (obr. 10) je spoločnosť Heineken Slovensko Sladovne (ďalej len HSS), a.s., nadále najváčšou a najmodernnejšou sladovňou (obr. 11) nielen na Slovensku, ale aj v celom stredoeurópskom regione (Ševčík, 2017). Napriek tomu, že sladovňa patrí k najvýkonnéjším odberateľom elektrickej energie v regióne Komárna, spotrebou energie sa radi k jednej z najefektívnejších sladovní vobece.

Sladovňa beží v nepretržitej prevádzke a každý deň spracuje v priemere 360 ton vyčisteného sladovníckeho jačmeňa, z ktorého sa vyrobí približne 305 ton svetlého sladu (Bartakovics, 2012; TASR, 2017). Za osemhodinovú pracovnú zmenu je schopná prijať 800 ton jačmeňa. Prijem jačmeňa môže prebiehať súčasne nákladnými vozdíjami (obr. 12) a železničnou dopravou.

Čo sa týka odrôd sladovníckeho jačmeňa, na konci 90. rokov, resp. na prelome milénia sa medzi najviac vykupované radili predovšetkým slovenské odrody Jubilant, Kompakt či Expres. Od roku 2004 sa začala dopredu dostávať česká odroda Malz, ktorá sa držala v popredí prakticky až do nedávnej minulosti. Spočiatku jej sekundová časť sa vinula ďalšia česká odroda Ebson a po nej holandská odroda Kangoo, ktorá je dodnes vobeč najviac vykupovanou odrodo v rámci HSS. V súčasnosti HSS preferuje odrody s výberovou skladovňou, s vysokým extraktom a vysokým stupňom prekvasenia a s nižším obsahom betaglukánov (Ševčík, 2017).

Celková skladovacia kapacita činí priamo v Hurbanove približne 40 000 ton na jačmeň a 15 500 ton na slad. Sladovňa má však k dispozícii aj ďalšie skladovacie priestory mimo Hurbanova, čo umožňuje vyrábať homogénný slad bez výrazných odchýl

Po sladovniach v Belgicku a Mexiku disponuje HSS celosvetovou trefou najváčšou výrobnou kapacitou v rámci celého koncernu Heineken. Ak hovoríme o kvalite, je na tom hurbanovský slad ešte lepšie. Celý výrobný proces je neustále monitorovaný a automatizovaný, čo umožňuje vytrábať homogénný slad bez výrazných odchýlok (Bartakovics, 2012).

Dokumentujú to aj výsledky tzv. Q18 reštrika, podľa ktorých dosiahlo v roku 2017 práve slad z Hurbanova v konkurenci všetkých sladovní spoločnosti Heineken celosvetovo najlepšie výsledky. Hodnota

5 THE PRESENT

Despite reduction in the maltery’s annual production capacity after 2012 down to approximately 111,000 tonnes (Fig. 10), Heineken Slovensko Sladovne (hereafter HSS) is still the largest and most state-of-the-art maltery (Fig. 11) not only in Slovakia, but also in the entire Central Europe region (Sevčík, 2017). Although the maltery is the largest electricity and gas customer in the Komárno region, in terms of energy consumption it is one of the most effective malteries in general.

The maltery runs continuous operations, processing on average 360 tonnes of cleaned matting barley daily, from which approximately 305 tonnes of pale malt will be produced (Bartakovics, 2012; TASR, 2017). One eight-hour work shift can intake 800 tonnes of barley. barley can be received by truck (Fig. 12) and rail at the same time.

With regard to the matting barley varieties at the end of 90s resp. at the turn of millennium, the most bought were mainly Slovak varieties like Jubilant, Kompakt or Expres. Since 2004, Czech variety Malz has started to advance and it has virtually remained in the fore-

Fig. 9 New kiln from bird’s eye view
Obr. 9 Nový hvozd z vtáčej perspektívy

Fig. 10 Production and export of Hurbanovo malt in the last 20 years
Obr. 10 Výroba a export hurbanovského sladu za posledných 20 rokov
front until the recent past. Initially, she was followed by another Czech variety Ebson and especially Dutch variety Kangoo, which is still the most purchased variety within the HSS. Currently, HSS prefers varieties with good malting quality, high extract content in dry matter, high degree of attenuation and low content of beta glucans (Ševčík, 2017).

The premises of the Hurbanovo plant have a storage capacity of approximately 40,000 tonnes of barley and 15,500 tonnes of malt, but the maltery also has available additional owned and leased off-site storage facilities.

After the malting plants in Belgium and Mexico, HSS has the world’s third largest production capacity within the entire Heineken concern. The stats are even better for Hurbanovo malt when it comes to quality. The entire process is continually monitored and automated, allowing for homogenous malt production with no significant deviations (Bartakovics, 2012).

This was also reflected in the Heineken Q18 rankings. According to them, Hurbanovo malt achieved in 2017 the best results of all the Heineken malteries worldwide. Q18 value is an indicator of the analyzed malt quality as it consists of all measured malt parameters and its specifications. These are altogether 18 quality indicators of malt and wort produced from it, including extract, protein content, friability and others.

Malt is the most important ingredient for beer production, fundamentally affecting its character and forming its body. For example, Zlatý Bažant beer is brewed with a hop to malt ratio of about 1 to 99. The quality of the malt is the absolutely key for the qualitative parameters and taste or sensory characteristics of the beer.

In addition to malt, the maltery also produces several thousand tonnes of by-products every year, primarily materials obtained when the barley is being cleaned (barley husks and small grains) or during the actual production of malt (malt culms and malt dust). Malt culms are sold to customers either as a free or granulated product.

### 5.1 Export

The Hurbanovo plant has always had high exporting ambitions. It began exporting its products when the plant opened. After a few years, both the malt and the beer found a fixed place on the foreign markets of Europe, North and South America, Africa, and Asia (Anonym, 1996). At that time, you would find malt customers in places like the USSR, Cuba, Japan, Germany, Romania, Yugoslavia, Venezuela, Sweden, and Norway.

HSS is currently not only the largest processor of malting barley in Slovakia, but also the largest exporter of malt. Malt is also the most important export commodity of Slovakia in terms of post-first-processing products. Over 3.4 million tonnes of malt have been produced in Hurbanovo since 1967, of which approximately 15% is processed by the Hurbanovo brewery to produce the beers from its portfolio. The remaining 85% is exported (Fig. 10) to 15 breweries in seven European countries, from which 35 varieties of beers are produced for a total of more than 7 million hectolitres annually.

At first, malt was also sold on the free market to Kazakhstan, Lithuania, and Russia. However, since 2006 it has only been sold to breweries in the Heineken group, meaning the range of customers is more or less constant. The largest customer for many years has been Grupa Żywiec in Poland, with smaller amounts sold to brewer-

Q18 is an indicator of analyze of quality sladu, nakoľko pozostáva zo všetkých hodnotených parametrov sladu a ich špecifikácií. Spolu ide o 18 kvalitativných ukazovateľov sladu a z neho vyrobenej sladiny vrátane extraktu, obsahu bieľkovaní, friability a ďalších.

Slad je najdlhšie obľúbeným produktom pre výrobu piva, ktorá zasadne neopenýuje jeho charakter a tvorí jeho telo. Prie rani vývoja piva Zlatý Bažant je napríklad pomoci medzi chmeľom a sladom až približne 1:99. Kvalita použiteľného sladu je tak pre kvalitativné parametrov či chuťové a senzorické vlastnosti piva absolútne klúčová.

Okrem sladu každoročne sladovňa vyprodukuje aj niekoľko tisíc ton vedľajších produktov. Jedná sa predovšetkým o materiály získané pri čistení jačmera (jačmenne plevy a zadný jačmer) alebo pri samotnej výrobe sladu (sladový kvet a sladový prach). Sladový kvet sa odberateľom predáva volne ložený alebo granulovaný.

#### 5.2 Podpora slovenských farmárov

Hurbanovská sladovňa každoročne nakupuje približne 45% celoko- vej domácей produkcie (Ševčík, 2017). Zároveň spracuje okolo 140 000 ton sladovníckeho jačmera ročne, pričom až 3/4 z tohto objemu pochádzajú z domácnosti zdrojov (TASR, 2017).

V prvých dekádach fungovania sladovňa sa slad balil prednostne do vriece (obr. 13). V 90. rokoch sa podiel vrecovaného sladu postupalne znižoval, pričom v novembri roku 2003 odštípili posledné zabalnené vrecia hurbanovského sladu do pivovarov v Kazachstane. Od tej doby sa slad dodáva výlučne volne ložený a sype sa priamo do dopravných prostriedkov (Bartakovics, 2012).

#### 5.3 Vývoj výroby piva

Kvasný prum. 64/2018 (5) / 2018.

Výkon výroby piva. HSS má na Slovensku v prvej polovici roka 2018 (5) / 2018. V 90. rokoch sa podiel vrecovaného sladu postupne znižoval, pričom v novembri roku 2003 odštípili posledné zabalnené vrecia hurbanovského sladu do pivovarov v Kazachstane. Od tej doby sa slad dodáva výlučne volne ložený a sype sa priamo do dopravných prostriedkov (Bartakovics, 2012).

#### 5.4 Vývoj výroby sladu

Kvasný prum. 64/2018 (5) / 2018.

Výkon výroby sladu. HSS má na Slovensku v prvej polovici roka 2018 (5) / 2018. V 90. rokoch sa podiel vrecovaného sladu postupne znižoval, pričom v novembri roku 2003 odštípili posledné zabalnené vrecia hurbanovského sladu do pivovarov v Kazachstane. Od tej doby sa slad dodáva výlučne volne ložený a sype sa priamo do dopravných prostriedkov (Bartakovics, 2012).

#### 5.5 Inovácie v sladovničom podnikaní

Kvasný prum. 64/2018 (5) / 2018.

Inovácie v sladovničom podnikaní. HSS má na Slovensku v prvej polovici roka 2018 (5) / 2018. V 90. rokoch sa podiel vrecovaného sladu postupne znižoval, pričom v novembri roku 2003 odštípili posledné zabalnené vrecia hurbanovského sladu do pivovarov v Kazachstane. Od tej doby sa slad dodáva výlučne volne ložený a sype sa priamo do dopravných prostriedkov (Bartakovics, 2012).

#### 5.6 Vývoj výroby sladu

Kvasný prum. 64/2018 (5) / 2018.

Výkon výroby sladu. HSS má na Slovensku v prvej polovici roka 2018 (5) / 2018. V 90. rokoch sa podiel vrecovaného sladu postupne znižoval, pričom v novembri roku 2003 odštípili posledné zabalnené vrecia hurbanovského sladu do pivovar -
ies in Romania, Austria, Hungary, Slovenia, Macedonia, and Bulgaria. (Bartakovics, 2012; TASR, 2017).

In the first few decades, the maltery preferred to package malt into bags (Fig. 13). In the 1990s, the proportion of bag-packaged malt was gradually reduced until finally in November 2003, the final Hurbanovo malt packaged in bags was shipped off to a brewery in Kazakhstan. Since then malt has been supplied strictly in bulk, loaded directly into the transport vehicles (Bartakovics, 2012).

5.2 Supporting Slovak Farmers

The Hurbanovo maltery buys approximately 45% of the total annual domestic production (Ševčík, 2017). It processes around 140,000 tonnes of malting barley per year, with three quarters of that sourced locally (TASR, 2017).

Seventy percent of all the suppliers of malting barley to Hurbanovo are primary producers - farmers. However, between 2006 and 2016 there was a reduction of malting barley growing areas by nearly 42%. Farmers are often drawn to grow other crops that are less susceptible to the ever-changing climate and that are easier to grow to food quality (Heineken Slovensko Sladovne, 2014).

That is one of the reasons that Heineken strives to support the efficient cultivation of malting barley by advancing cooperation between trading companies, breeding stations, seed companies, and the Slovak Beer and Malt Association of which it is a member (Ševčík, 2017; TASR, 2017).

HSS develops and implements projects in order to get closer to the cultivation practice, to emphasize the importance of the malting industry in Slovakia, and draw attention to the fact that even today malting barley growers in Slovakia have a customer base (Ševčík, 2017). Some of the regular activities of the malter are included in a malting field days, special conferences for farmers, and cooperation in developing quality barley varieties.

The decrease of barley acreages is one of the contemporary challenges faced by the Slovak malting industry, and the common objective is to continue to support Slovak growers of malting barley to achieve the largest possible percentage of malt production from local sources.

6 CONCLUSIONS

Malt is the most important Slovak export agro-commodity after the first processing. Nowadays, up to 90% of malt produced in Slovakia is being exported every year. Malting plant of joint-stock company Heineken Slovensko has a significant involvement on this successful export. In 2017, the maltery celebrated a half a century in business. This success would not have been achieved without dozens of impassioned and driven employees who have worked here over the
years and have contributed to the good name of malthouse with their professional approach toward their jobs. These people are the ones that have given and continue to give this plant a meaning (Fig. 14).

ACKNOWLEDGMENTS
This article contains memories and knowledge of former and current employees of Hurbanovo brewery and maltery. Internal materials respectively guidelines and instructions of joint-stock company Heineken Slovensko Sladovne are also used.

REFERENCES / LITERATURA
Anonymous, 1979: Západoslovenské pivovary a sladovne, n. p. Bratislava. Archiv Heineken Slovensko, a. s.
Anonymous, 1996: Zlatý Bažant, a. s. Brožúra, Hurbanovo, Zlatý Bažant, a.s. Archiv Heineken Slovensko, a. s.
Anonymous, 2000: Zlatý Bažant, a. s. Firemný leták, Hurbanovo, Zlatý Bažant, a.s. Archiv Heineken Slovensko, a. s.
Anonymous, 2003: Mega-Mälzerei im Herzen Europas. Brauerei-Forum., 18 (2): 244.
Bartakovics, Š., 2012: 10 rokov novej sladovne. Výročná správa z 30.11.2012, Hurbanovo, Heineken Slovensko Sladovne, a. s.
Cabadaj, P., 2000: Slovenské pivovarníctvo v toku času. Agentúra MCP, Žilina, 208 s. ISBN 80-968453-0-6
Heineken Slovensko Sladovne, 2014: Pestovatelia sladovníckeho jačmeňa majú na Slovensku silného partnera. Rolnícke noviny, 85 (11): 15.
Kastner, J., 1977: Technická pomoc pivovaru Hurbanovo. Výzkumný ústav pivovarský a sladašský, Brno.
Nentwichová, M., 1974: Technická zpráva. Výzkumný ústav pivovarský a sladašský, Brno.
Ševčík, T., 2017: Silný partner slovenských polohospodárov. Rolnícke noviny, 88 (13): 27.
TASR, 2017: Sladovňa v Hurbanove oslavuje 50 rokov od svojho založenia. Teraz.sk [online]. Teraz Media a.s., [cit. 2017-03-19]. Do stupne z: http://www.teraz.sk/ekonomika/pivovary-sladovna-v-hurbanove-oslavia/249303-clanok.html

6 ZÁVER
Slad je najvýznamnejšou slovenskou exportnou agrokomoditou po prvom spracovaní. V súčasnosti sa do zahraničia exportuje každý rok až 90% sladu vyrobeného na Slovensku. Na toto úspešnom výkon sa výrazným spôsobom podieľajú spoločnosti Heineken Slovensko, a.s. v Hurbanove. Tá v roku 2017 oslavila polstoročník svojho založenia. Tento úspech by nebol dosiahnutý bez niekoľkých desiatok zanietených a motívovaných pracovníkov, ktorí tu v priebehu rokov pracovali a ktorí svojim profesionálnym prístupom k práci priniesli k dobrému menu sladovne. Práve tito ľudia dávali a naďalej dávajú tejto prevádzke zmysel (obr. 14).

POĎAKOVANIE
V článku sú zakomponované aj spomienky a vedomosti bývalých či súčasných pracovníkov pivovaru a sladovne v Hurbanove. Použité sú tiež interné materiály, resp. smernice a inštrukcie Heineken Slovensko Sladovne, a. s.