

Investment Requirements for Stable Buildings to Board Horses

Boarding horses in conurbations is a good source of income for numerous farms. For planning economical facilities, data on investment requirements are the most important. Within a KTBL-research project, financed with federal and state funds, data on construction costs were ascertained for box stalls, for small groups and for large groups for small, medium and big stocks according to DIN 276. With €11,604 per place, the investment is about € 1000 lower than in box stalls. The housing in small groups is between these two systems.

With only 250,000 the number of horses in Germany was lowest in 1970. In the following years the stock went up, at present roughly 900,000 animals can be counted. An ever increasing demand for sports and leisure horses has been decisive for this development. Two thirds of the horse stock are kept in agricultural enterprises. For many farmers boarding horses is an important source of income. However, only when stables are utilised sufficiently, a satisfying economic performance can be expected. Therefore investments have to be scrutinised thoroughly beforehand, since building costs amount to about one third of the overall yearly costs [5].

Aim of Project

It was the aim of the federal and state financed KTBL-Research Project to determine the building costs according to DIN 267 and DIN 277 for the common horse housing systems. This is to add data on boarding horses in agricultural enterprises to expand the capacity of the KTBL-Databank BAUKOST [4].

Data and Method

The three most common stable systems for boarding horses served as a base for calculation of building costs:

- Individual boxes (box stalls) with direct access to an individual paddock
- Keeping in small groups (6 horses per group) with feeding boxes
- Keeping in big groups (up to 24 horses per group) with an automatic system for individual feeding of concentrate

For each of the stable systems a ground plan for small (12 horses), medium (28 resp. 24 horses) and big units (56 resp. 48 horses) has been worked out, the latter being merely a doubling of the medium unit.

An example of the ground plan for the big group with approximately 24 boarding horses has been laid down in figure 1. The ground plans serve as a general information for possible variants. As the ground plans have been developed to meet practical needs, there are not always the same functional areas in each plan. This is to say, that all stable systems include feed and equipment store, currying and washing place, tack room, restroom, bathroom and toilets. Storage room for hay and straw has been considered only for group systems, manure heaps for none of them. The building costs for riding halls have not been accounted for in all the systems. More detailed information can be obtained from the project report [3].

For buildings, timber constructions with clamped standards have been selected in or-

Dr. Bernhard Haidn is co-ordinator of process engineering for animal production at the Institute for Agricultural Engineering, Farm Buildings and Environmental Technology (ILT) of the Bavarian State Research Center for Agriculture (LfL) Vöttingerstr. 36, D-85354 Freising; e-mail: bernhard.haidn@lfl.bayern.de
 Architect Hubert Liebl, freelance, Großenschwand 31, D-92723 Taannesberg; e-mail: Hubertliebl@aol.com

Keywords

Horse keeping, housing, investment requirements

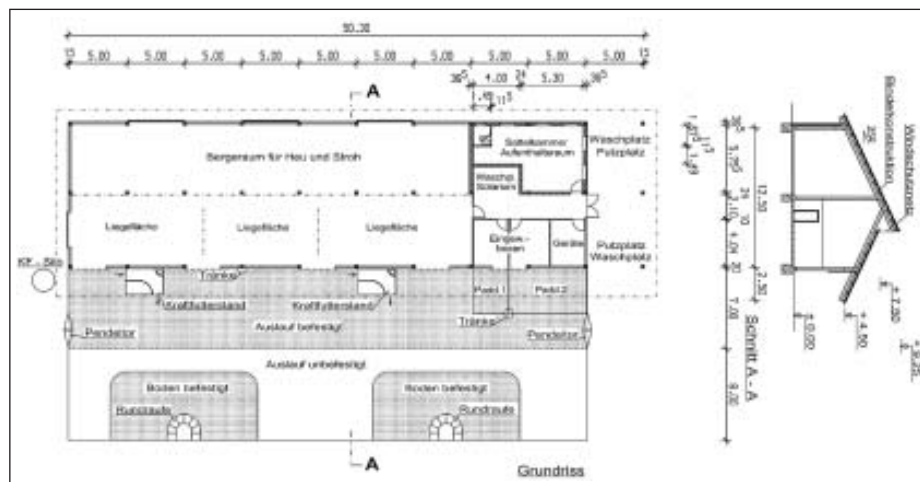


Fig. 1: Ground plan and profile of the housing system for large groups up to 24 horses

Table 1: Planing marks per unit of the leisure horse keeping facilities

Housing system Animal units		Individual boxes			small groups			big groups			means Ø
		12	28	56	12	24	48	12	24	48	
BGF	gross area (m ²)	31,56	26,93	26,93	34,75	34,64	34,64	41,98	26,83	26,83	31,68
KGF	construction area (m ²)	1,51	0,94	0,94	1,11	0,92	0,92	1,34	0,80	0,80	1,03
HNF	main using area (m ²)	30,06	25,99	25,99	33,64	33,72	33,72	40,64	26,02	26,02	30,64
BRI	gross volume (m ³)	188,70	161,02	161,02	244,03	245,35	245,35	303,92	194,22	194,22	215,31
STF	stable area (m ²)	18,45	18,39	18,39	15,00	15,25	15,25	15,19	9,18	9,18	14,92
BF	operation area (m ²)	11,61	7,60	7,60	18,64	18,47	18,47	25,45	16,84	16,84	15,72
STR	stable volume (m ²)	103,04	102,69	102,69	107,66	104,74	104,74	107,20	64,35	64,35	95,72
LF	walking area (m ²)	24,00	24,00	24,00	25,25	31,30	31,30	31,40	28,31	28,31	27,54

der to use internal labour and material (wood) more efficiently and to fortify walls between pens and boxes. The outer walls, 12 cm thick, consist entirely of wood with systems for individual boxes and of simple but robust wooden boards for the group systems. Tack room and washing place inside the stables have been planned as solid structure with thermal insulation. All other areas, as to horses demands, have not been insulated.

The classification of the building costs took place according to DIN 276 under special considerations of the agricultural sector as laid down by the German Federal Agricultural Research Centre (FAL). After compiling separate construction specifications for each stable system, the cost calculations have been carried out. As basis, different data banks were used. These are KTBL-Baukost [4], the Information Centre for Building Costs of the Association of German Architects (BKI) [2], orientation prices of the ALB-Hessen [1] as well as offers from various stable building companies. After thorough professional checking of these data, a standard price of each cost position has been determined. On top of that, planning index numbers after DIN 277 and other specific planning index numbers have been established (table 1).

Results

Calculations for average investment requirements per animal unit resulted in 12,111 € (fig. 2). 74.2 % of this sum has to be allotted to the cost element 300 (building - construction). 12.0 % to the cost element 400 (building - installations) and 13.8 % to the cost element 500 (outside - facilities). The costs for foundations, outer walls and roofs (included in cost element 300) represent about 20 % each, and thus dominate the total costs. Due to the numerous single boxes the costs for interior equipment and installations are higher for individual boxes (10 % of total costs) as compared to those for group housing systems (4 % of total costs). The same can be said about the position 'outside equipment and installations' (12 % of total costs for in-

dividual boxes as against 4 % for group housing systems). This is mainly because the costs for installations to muck out individual boxes are much higher than those with group housing systems.

With an increasing stock, the average investment demand decreases from 13,671 € (small stock) to 11,524 (medium stock) to 11,406 (big stock). The biggest difference can be observed within the systems for big groups between the small and the medium/big stock sizes. This is because with the small group system the area for storage room is comparatively high, which can be deduced from table 1 (42 m² gross area per animal unit, 15 m² stable area per animal unit). On the other hand the stable areas with the medium and big stock sizes are rather small and more or less equivalent to the lying area (approx. 9 m²; see table 1). This is mainly because the automatic system for individual feeding is situated outside the stable building.

Although, as against individual boxes, a high proportion of storage room is included in the calculations for group systems, the average total costs are lowest with big groups, that is to say 11,604 € per animal unit. For individual boxes the building costs are highest (12,617 € per animal unit), for small groups they are between these two (12,381 €).

According to the FAL cost block method, the allocation of the average investment requirements for all nine stable buildings has the following results: 82.4 % stable, 5.1 mucking, 4.8 % feeding and 7.7 % others.

Literature

- [1] ALB Hessen: Richtpreise für den Neu- und Umbau landwirtschaftlicher Wirtschaftsgebäude und ländlicher Wohnhäuser, Kassel 2001/2002
- [2] BAUKOSTENINFORMATIONSZENTRUM DEUTSCHER ARCHITEKTENKAMMERN: BKI Baukosten, Teil 3 Arbeitsunterlagen, Stuttgart, 2002
- [3] Haidn, B. und H. Liebl: Investitionsbedarf für die Pensionspferdehaltung in landwirtschaftlichen Betrieben. Forschungsbericht Bayerische Landesanstalt für Landtechnik, Freising, 2002
- [4] KTBL-BAUKOST : www.ktbl.de
- [5] Rosenberger, G.: Wirtschaftlichkeit von Pensionspferdebetrieben. Bauen für die Landwirtschaft, H.1, 1998

Fig. 2: Required investment of the leisure horse stables depending on the housing system and number of units

