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Investment needs of horse stables

For those wishing to start a horse boarding enterprise and who do not have enough area for rebuilding in existing stable premises, an investment of from 10,000 to 14,000 Euro per horse place must be calculated for a new building. This is indicated in the results of a study produced by the Lower Saxony Land Society (NLG) for the Association for Technology and Structures in Agriculture (KTBL). The price range depends on the different requirements for the selected stabling system whereby main differentiation is between single and group housing

Keywords
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Abstract
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Where new stables are built the most common system is single box with direct outdoor access or small paddock (**figure 1**). However, group housing is being discovered by a growing number of interested people.

The publication“Leitlinien zur Beurteilung von Pferdehaltungen unter

Tierschutzgesichtspunkten“ (Guidelines for assessment of horse keeping under animal welfare aspects“ (BMELV 2009) points out: “Horses are animals that live in groups. Social contact between one another is therefore indispensable.”

In their natural environment horses cover considerable distances in groups, mainly at walking pace and thereby continually grazing. This is why generously-dimensioned paddock areas, ideally in combination with pasture access and sufficiently-sized lying areas in the stable are all part of species-appropriate horse keeping. In planning the function areas strict separation is required for lying, feeding and drinking so that movement is encouraged through the distances thus created between the respective areas.

For determining required investment this study looked at the following horse keeping systems:

- Single boxes with paddock
- Small groups with outrun
- Large groups with outrun

Single boxes with paddock

In single box housing the 3 x 4 m boxes are symmetrically lined along the stable passage. Each box has access to an 8 m long paddock with plastic meshing on the ground. The frost-protected water troughs are also situated in the paddocks, ensuring separation of functions feeding and watering. Also within the stable building is a tack room, a storeroom for equipment and feed, a washing area with solarium and areas for storing hay and straw.

The entrance to the stable building is through a generously dimensioned roofed and paved wash area.

A uniform construction principle was selected for all models to ensure comparability of building design even where the horse keeping system is different.

The 12.50 m wide stable building is of traditional steel frame construction supporting a 22° slope gable roof of corrugated fibre-cement sheets with outer walls of unplastered agricultural brickwork.

Fig. 1

Paddockbox (photo: Witzel)

Eave-ridge ventilation was chosen to give the required air exchange. The upper area of the eave sidewalls features space boarding with 2 cm spacing to allow fresh air access into the building. Surplus heat and exhaust air escapes (and light is introduced) via a continuous 2 m wide ridge gap.

Small-group housing in multi-compartment stable with paddocks

In the investigated stable models for small groups of horses with 12 and 24 animal places up to six horses share a laying area. The areas are divided by wall elements of approx. 1.30 m height. For integration of newcomer horses, a single box with paddock is situated next to this area so that gradual contact is enabled between newcomers and established group members. Feeding takes place in feeding stations with station:horse ratio of 1 : 1.
A large area is planned for the storage of hay and straw in addition to the tack room, equipment store and interior washing facility with solarium. The larger model is conceived as a facility including several buildings (**figure 2**). A building situated centrally between two generously-dimensioned paddock areas includes all the feeding stations with one station per animal, the additional rooms and the roofed and paved outer washing facility. The drinking troughs are situated at the other end of the paddock area at the outer walls of the buildings with lying areas. Again, this separation of functions generates longer distances for the horses, addressing the natural behavioural needs of the animals. According to requirements, four groups of six horses or two groups of 12 horses can be stabled.

At each end of the complete facility is situated a stable with lying areas for two small groups and larger storage areas for hay and straw. Each lying area has two accesses to the paddock so that conflicts between animals of different ranking in the group can be avoided.

The two paddocks, each of 620 square metres, are paved with different materials. The areas directly in front of the buildings and under the overhanging eaves are floored with robust concrete paving which is easy to clean and remove dung from. The adjacent areas feature paddock matting on the ground and form the transition in each case to generously dimensioned sanded areas where the horses can also roll around. In each of the two paddocks there are two round fodder racks which can be filled from outside the paddock and which offer the animals ad lib feed.

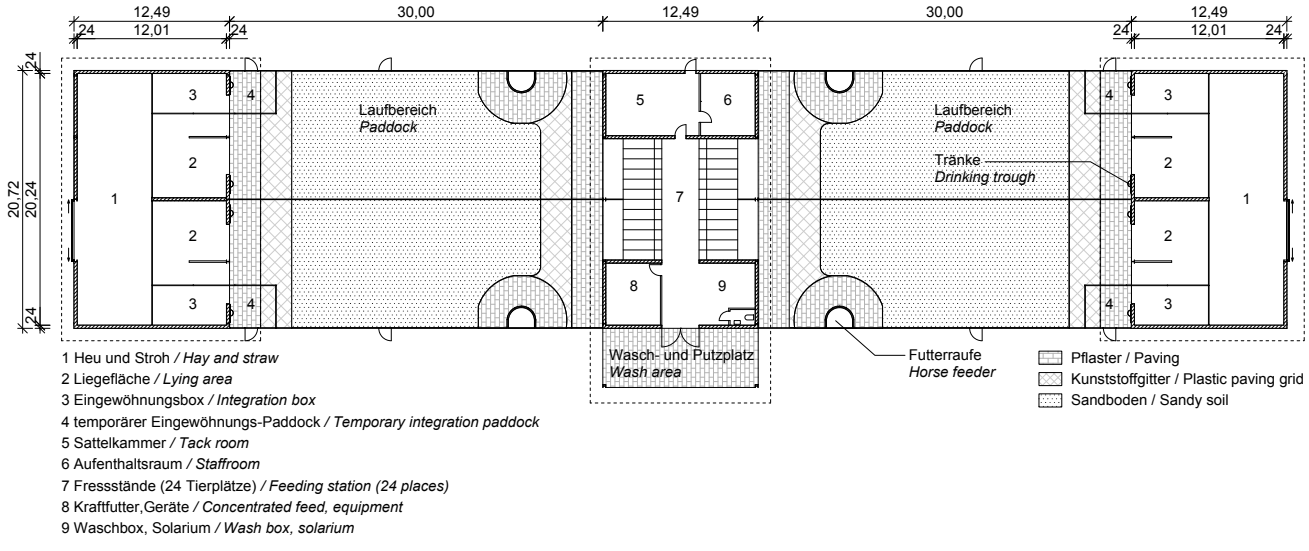
Large-group horse keeping in multi-compartment stable with paddock

Horse keeping in large groups is represented in the study through two models for groups of 12 and 24.

In the planning example for the 12-horse group, the three-compartment lying area is divided by half-height parapet elements. Concentrate feeding takes place in single feeding stations. In the large-group model for 24 horses, two separate lying areas divided by wall panels are offered. In this case, a computer-supported feeding station controls concentrate rationing.

As with the small-group stabling, integration boxes for new members of the group are situated near to the lying areas.
The variation in materials used for ground cover in the paddock meets different requirements. With 45 square metres per animal place, the outrun offers a sufficiently dimensioned open area. In addition to the auxiliary rooms in the stable building, storage for hay and straw is integrated, as with all the group stables in the study. The resultant short distances for carrying feed to the cribs and feeding stations is labour-efficient. An overview of the stable systems compared in the study is summarised in **table 1**.

Fig. 2



Small groups for 24 horses

Table 1

Characteristics and key figures

Modell *Model*	Anzahl der Tierplätze (Gruppen) *Animal places (groups)*	Fütterung *Feeding*	Flächenangebot je Tierplatz [m²] *Floor space per animal [m²]*		BGF[1] [m²]
			Liegebereich *Lying area*	Auslauf *Paddock*	
Einzelboxenstall mit Paddock/*Single box with paddock*					
1a	12	Futterkrippen/*Manger*	12	24	339
1b	28	Futterkrippen/*Manger*	12	24	684
Kleingruppenhaltung mit Auslauf/*Small groups with paddock*					
2a	12 (2)	Einzelfressstände/*Feeding station*	7,5	52	384
2b	24 (4)	Einzelfressstände/*Feeding station*	10	52	776
Großgruppenhaltung mit Auslauf/*Large groups with paddock*					
3a	12 (1)	Einzelfressstände/*Feeding station*	8,7	47	471
3b	24 (1)	Rechnergestützte Kraftfutter-Abruffütterung *Computerized feeding system*	8,7	44	571

[1] Bruttogrundfläche/*Gross floor area.*

Annual costs

The annual costs are calculated from depreciation, interest, repairs and maintenance, insurances and taxes (**table 2**). These are fundamental to calculation of enterprise profitability and also elemental in the reckoning of minimum boarding price. For the 12-horse group the annual building costs are calculated at 1 200 Euro per animal place; for stable models for 24 to 28 horses these run to around 900 Euro per animal place. The monthly sum calculated from these costs offers a basis for the minimum horse boarding price and is 95–105 Euro for 12-horse group housing and, for 24 to 28 animal places, 70–80 Euro.

Calculating the cost blocks

Alongside the attribution of building costs according to DIN 276 "Costs in structural engineering", investment requirement was also calculated according to the cost block method of the former Federal Research Institute for Agriculture (FAL) (**table 3**). Here, characteristic values for function-linked parts of the building, or groups of building parts, are determined. For the table of models in this study these can be attributed to four components: stable, manure, feed and neighbouring facilities including investment requirement for the paddocks.

On average, the largest proportion of investment requirement represents the cost block stable building with 78 %. Next

Table 2

Investment needs and annual costs

Modell/Model	Nutzeinheit *Unit*	Investitionsbedarf[1] [€] *Investment needs[1] [€]*		Jahreskosten [€] *Annual costs [€]*	
	TP[2]	gesamt *total*	je TP[2]	gesamt *total*	je TP[2]
Einzelhaltung/*Single horsebox*					
1a	12	157.161	13.097	14.081	1.173
1b	28	289.243	10.330	26.153	934
Kleingruppenhaltung/*Small groups*					
2a	12	169.007	14.084	14.489	1.208
2b	24	276.514	11.521	23.232	968
Großgruppenhaltung/*Large groups*					
3a	12	175.602	14.633	15.150	1.262
3b	24	220.953	9.206	19.451	810

[1] Alle Preisangaben ohne Mehrwertsteuer/*Exclusive VAT.*
[2] Tierplatz/*Animal place.*

Table 3

Average total costs of cost blocks

Haltungssystem *Housing system*	Kostenblock/*Cost block*							
	Stall *Building*		Mist *Manure*		Futter *Food*		Nebenanlage *Outdoor facilities*	
	€/TP[1)]	%	€/TP[1)]	%	€/TP[1)]	%	€/TP[1)]	%
Einzelhaltung *Single horsebox*	9.241	78,9	772	6,6	25	0,2	1.675	14,3
Gruppenhaltung *Group housing*	9.652	78,1	827	6,7	429	3,5	1.452	11,7

[1)] Tierplatz/*Animal place*.

comes cost block neighbouring facilities with 13 %. The cost block manure represents approx. 7 % and the one for feed 3 % of total investment.

Online databank for building costs

Further planning data for determining investment requirements for stables and riding facilities can be researched through the online application "Baukost". This charged-for access under www.ktbl.de offers entry into a comprehensive databank for agricultural buildings. For animal housing and other constructional facilities in agriculture reference figures for planning, construction descriptions and cost specifications according to DIN 276 "Costs in structural engineering" are available.

The models featured can be individually modified with regard to size, numbers and unit prices. Additionally, there exists the possibility of matching the price level in total via a recognised building price index.

Conclusions

The required investment per animal place for group stabling of horses as investigated here turned out higher because these stable models included additional areas for hay and straw storage. Conversely, only a small temporary storage area is included in the single box stable plans.

In total, the comparison between single and group stabling systems showed that no large difference exists with regard to initial investment and for running costs during expected working lifetime.

Literature

[1] Lindenberg, A. (2010): Investitionsbedarf für Pferdeställe und Reitanlagen. Interner Abschlussbericht an das KTBL im Rahmen des KTBL-Arbeitsprogrammes „Kalkulationsunterlagen (KU)". KTBL, Darmstadt

[2] DIN 276 (2006): Kosten im Hochbau, Deutsches Institut für Normung e.V. Berlin

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