

A survey on the hygienic standard of feeds for horses associated with diseases

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Introduction

A well balanced nutrition belongs to an essential condition for wellbeing or fitness as well as fertility or longevity of horses. Therefore, energy and nutrient supply is of interest, that can be assessed by feed intake (amounts, composition of feed) as well as by analyses of different parameters in body own substrates (blood, urine a.s.o.). Moreover, feeding technique has to be considered (relation of roughage to concentrate, frequency, amount per meal). However, tolerability of feeds, rations or techniques depends not least on hygienic quality of the offered feeds. In the following comments common lacks concerning hygienic status as well as consequences for horses' health will be presented. Following interpretation bases on 766 feedstuffs sent in to our institute in the years 2000 until end of June 2005. Therefore, it has to be commented critically, that these results do not reflect the actual situation in practice, because the evaluated feedstuffs were sent in due to health problems.

Faults in the hygienic standard of feedstuffs for horse - Reason for analyses of the hygienic standard of the feeds

All feedstuffs were sent in with detailed preliminary reports. Colics or a reduced performance (tiredness, insufficient locomotion) belong to the common health problems. Moreover increased levels of liver enzymes, cough or allergic symptoms (oedema, „swollen legs“) gave reason for analyses of feeds (fig. 1).

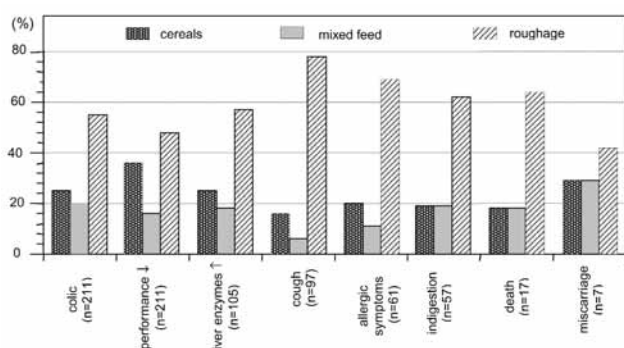


Fig 1 Common reasons for analyses of the hygienic standard of feeds.

Sensory control

A careful sensory control (s.c.) gives first important information about the hygienic standard of the feedstuffs (see table 1).

Table 1 Feedstuffs for horses with hygienic faults in the sensory control.

feedstuff		smell		appearance		texture		parasites***		
n	n	n	%	n	%	n	%	n	%	
I	oats	181	55	30	132	73	14	8	28	15
	barley	12	2	17	8	67	0	---	0	---
	corn	5	1	20	0	---	1	20	1	20
II	muesli	62	13	21	7	11	7	11	7	11
	concentrate*	57	0	---	2	4	1	2	5	9
	mash	5	0	---	0	---	2	40	0	---
III	hay	247	87	35	104	42	73	30	93	38
	grass silage	78	36	46	30	39	0	---	2	3
	straw	119	66	55	96	81	16	13	10	8
I:	cereals	198	58	29	140	71	15	7	29	15
II:	mixed feed**	124	13	10	9	7	10	8	12	10
III:	roughage	444	189	43	230	52	89	20	105	24

* pelleted ** commercial *** mites like *Acarus siro*, pests like *Lepinotus spp.*

For example, a heavy dusty character or a mouldy odour of the feedstuff correlated in many cases with a high level of moulds, a yeasty smell indicated high contents of yeasts. Moreover, a massive load by pests or mites was combined with a lower dry matter content of the feed that is related in general to higher counts of microorganisms. In the sensory control the parameter „texture“ can be used to assess the dryness (shelf life) of the feeds (see figure 2).

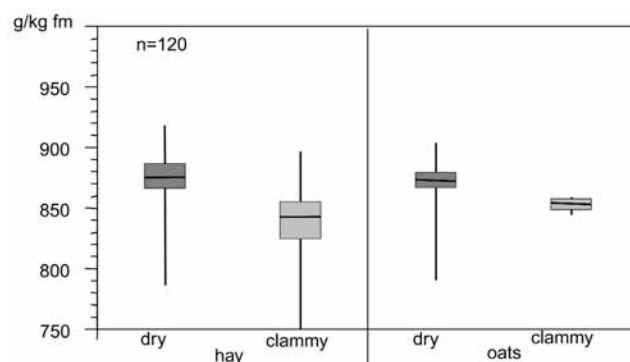


Fig 2 Expressiveness of the parameter „texture“ (dry matter content of feed-stuffs characterized in the sensory control as „dry“ or as „clammy“).

Microbiological status

Usual microbiological analyses are informative for different feed stuffs (see table 2), but the interpretation of the results needs a distinction between epiphytes and germs that indicate spoilage (see contribution Kamphues) as well as between normal counts (n.c.) in different feeds.

Hygienic deviations in the hygienic quality could be observed in cereals and roughage, whereas commercial mixed feeds showed less imperfections.

Lipopolysaccharides

The classical microbiological investigation (cultural proof) of feedstuffs, that are submitted to different procedures at the processing (drying, high temperatures, intensive grinding,

Table 2 Microbiological status of different feedstuffs for horses.

		total		aerobe germs		total		moulds		total		yeasts	
		n	%	n	%	n	%	n	%	n	%	n	%
I	oats	156	58	37	158	51	32	153	54	35			
	barley	10	2	20	10	2	20	8	1	13			
	corn	5	2	40	5	1	20	5	1	20			
II	muesli	53	18	34	54	7	13	46	6	13			
	concentrate*	42	3	7	46	3	7	42	1	2			
	mash	5	0	—	5	0	—	5	0	—			
III	hay	218	52	24	232	80	34	206	15	7			
	grass silage	69	22	32	73	24	33	71	31	44			
	straw	100	50	50	111	46	41	108	16	15			
I	cereals	171	62	36	173	54	31	166	56	34			
II	mixed feed**	100	21	21	105	10	10	93	8	9			
III	roughage	387	124	32	416	150	36	385	62	16			

n.c. = normal counts * pelleted ** commercial

high pressure, addition of acids a.s.o.) gives sometimes no dependable results. In these cases the determination of the lipopolysaccharide level (= LPS; part of the cell wall of gram-negative germs) gives indirectly information about the hygienic standard of the feedstuffs (see table 3).

Table 3 Lipopolysaccharide levels of different feedstuffs for horses.

		total		lipopolysaccharide level (µg/g)					
		n	%	< 20		20 - 50		> 50	
I	oats	112	36	32	23	21	53	47	
	barley	9	4	44	3	33	2	22	
	corn	4	3	75	1	25	0	—	
II	muesli	41	32	78	5	12	4	10	
	concentrate*	28	20	71	8	29	0	—	
	mash	5	3	60	2	40	0	—	
III	hay	123	30	24	26	21	67	55	
	grass silage	17	5	29	7	41	5	29	
	straw	45	3	7	9	20	33	73	
I	cereals	125	43	34	27	22	55	44	
II	mixed feed**	74	55	74	15	20	4	5	
III	roughage	185	38	21	42	23	105	57	

* pelleted ** commercial

Health problems related to a reduced hygienic standard

Based on a critical sensoric examination as well as continued analyses these suspicions could be beared out in many cases (see table 4).

Conclusion

A critical proof of the feedstuffs from the delivery until feeding is a fundamental condition to avoid health disorders or reduced performance caused by lacks of the hygienic standard. Veterinarians should be able to assess the hygienic quality of the offered feedstuffs (in particular in cases with a high frequency of colics, disorders of the respiratory tract a.s.o.). However, not the industrially produced mixed feeds/concen-

Table 4 Health disorders of preliminary report and findings of feed analyses.

health disorders	samples n	lacks n (%)	in the criticized feedstuffs lacks concerning ...				
			s.c.	LPS	bacteria	moulds	yeasts
colics	211	115 (55)	63 (55) ¹	75 (65)	49 (43) ²	54 (47)	56 (49)
performance ↓	211	82 (39)	28 (34)	58 (71)	8 (10)	25 (30)	7 (9)
liver enzymes ↑	105	50 (48)	25 (50)	39 (78)	10 (20)	10 (20)	8 (16)
cough	97	52 (54)	23 (44) ¹	33 (63)	25 (48)	32 (62)	24 (46)
allergic symptoms	61	23 (38)	12 (52)	14 (61)	7 (30)	12 (52)	6 (26)
indigestions	57	22 (39)	7 (32)	18 (82)	2 (9)	7 (32)	11 (50)

¹) mouldy-musty odour ²) mainly coryneforme bacteria (43%), *Pantoea agglomerans* (30%), *Bacillus subtilis* (30%) and coliforms (29%)

trates, but especially the roughage (even if it is only used as bedding material like straw) are worthy of note and should be proofed critically (intensive sensory control combined with further analyses).

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