Health Quality Control of Laboratory Animals of the Czechoslovak Academy of Sciences (ČSAV)

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At the XXII. International symposium on biological models held at Hrubá Skalá in 1984 the project on categorization of laboratory rats and mice was discussed (*Klír et al.* 1984). The project was worked up by the Physiological Institute in cooperation with the Institute of Molecular Genetics, both of the ČSAV. The purpose of this project was to unify and to extend the nationally admitted genetic nomenclature and to delimitate the extent of genetic monitoring of the breeding colonies of laboratory animals and from the viewpoint of the health conditions to delimitate the categories, extent and frequence of their control.

This project was accepted both by the ČSAV and by some other institutions. The realization of the project depends on the establishing of reference workplaces and skilled collectives responsible for health examination.

In the field of activity of the ČSAV two diagnostic reference centres have been established during the past two years. The centre for the laboratory mouse has been established in the biomodels department of the Institute of Molecular Genetics and

Table 1. Undesirable microorganisms for individual categories (I—IV) of laboratory rats and mice.

LABORATORY RATS AND MICE	
CATERORY	BACTERIA
IV III II I	Brucella sp.
	Erysipelothrix rhusiopathiae
	Salmonella sp.
	Mycobacterium tuberculosis
	Yersinia pseudotuberculosis
	Leptospira (some serotypes)
	Listeria monocytogenes
	Trichophyten sp.
IV III II	Bacillus piliformis
	Bordetella bronchiseptica
	Corynebacterium kutscheri
	Streptobacillus moniliformis
	Zoopathogenic fungi
IV III	Pasteurella sp.
	Zoopathogenic mycoplasmas
IV	Pseudomonas aeruginosa
	Streptococcus pyogenes alfa
	Staphylococcus aureus
	Proteus sp.
	Klebsiella sp.
	Aerobacter sp.
	Citrobacter sp.
	Pneumococcus sp.

Table 2. Undesirable parasite organisms for individual categories (I—IV) of laboratory rats and mice.

LABORATORY RATS AND MICE	
CATEGORY	PARASITE
IV III II I	Sarcoptes sp.
I	Cestodes, including developmental phases
I	Toxoplasma gondii
II	Zoopathogenic protozoa (Spironucleus muris, Giardia muris, Eimeria sp.)
II	Zoopathogenic nematoda (without species belong to category IV)
II	all ectoparasites
III	Encephalitozoon cuniculi
III	Pneumocystis carinii
IV	Syphacia sp.
IV	Aspiculuris tetraptera

centre for the laboratory rat was established in the BEM-department of the Physiological Institute of the ČSAV.

After two year's practice we have acquired some experience and collected results which we should like to present. Since we shall not describe the genetic monitoring in our paper, we have concentrated our interest on the health control only which is involved in the categorization project and given by the delimitation of undesirable microorganisms in each animal category. In the following Tables 1, 2, 3, a thematic survey of every kind of agens and their delimitation within the categories is given. Gnotobiotic animals belong in the categories V and VI (Table 4).

The extent and frequency of laboratory examination, i. e. the regular control of health condition of the laboratory rats and mice are presented in the Table 5.

Our determinations of the number of samples and animals are based on our own and foreign experiences as well as on data given in the available literary sources. According to our opinion they are the minimum quantities which may consider the number of animals of the examined population, the presumed contamination of population, the epizootologic situation

Table 3. Unsiderable microorganisms — viruses for individual categories (I—IV) of laboratory rats and mice.

LABORATORY RATS	
CATEGORY	VIRUS
IV III II I	LCM —
	Theiler-GD VII
	Sendai
	Reo-3
	PVM
	Toolan-H 1
	Kilham rat virus
	mouse adenovirus
	RCV
	SDA
	LDH

LABORATORY MICE	
CATEGORY	VIRUS
IV III II I	LCM
	Ektromelie *
	Theiler-GD VII
	Sendai
	Reo-3
	PVM
	MVM
	Polyoma
	K virus
	mouse adenovirus
	MHV
	LDH

* : in unvaccinated breeding colonies only.

Table 4. V. and VI. caterory of laboratory mice and rats.

CATEGORY V

Only known microorganisms can be present with which the animals were associated in a normal or an artificial way

CATEGORY VI

All microorganisms which can be ascertained by the present accessible examination methods are excluded

Table 5. Extent and frequency of laboratory examination of rats and mice. Regular examination of ČSAV — breeding colonies.

CATEGORY	I.—IV.
LABORATORY METHOD	Frequency and extent
Parasitological examination of blood	2 × 40 samples p.a.
Parasitological examination of faeces	4 × 50 samples p.a.
Helmintological section	2 × 10 animals p.a.
Bacteriological examination of faeces	4 × 50 samples p.a.
Sterile section	2 × 10 animals p.a.
Virological examination Serological examination of blood	2 × 50 samples p.a.
Patho-anatomical section	Animals with clinical symptoms of infections

in our country as well as the laboriousness and reliability of the methods used and the overall costs of such an examination.

And now some words to the very performance and the results of the health control of laboratory rats bred in the Physiological Institute of the ČSAV since 1984 till 1986.

The health control included regular laboratory examination of blood serum / virology and parasitology /, examination of faeces / parasitology and microbiology /, helmintological autopsy and sterile autopsy of the selected animals. Besides, contaminated, ill and suspiciously fresh died animals, blood serum and faeces of several external breeds were examined in laboratory. The results are presented in the Table 6.

We should like to mention that in animals showing clinical manifestations of disease, in animals suspected, ill or freshly died, also the pathological examination was performed.

The control proved that the animals of the individual categories are up to the demands on health condition and contamination with microorganisms for the given category.

On the basis of our short experience in the health control, we can summarize:

1. The reliability of finding undesirable agens has increased due to regularly repeated examinations and due to the selection of animal age category.
2. The kind of methods applied is decisive as to the demand of time and laboriousness of the examination.
3. To evaluate the examination results merely according to the number of collected and examined samples is premature. The number of samples is one of the criteria only.
4. It is necessary to distinguish whether

Table 6. Health quality control of laboratory rats (1984—1986).

Control	VIROLOGY			MICROBIOLOGY				PARASITOLOGY			
Breeding Colony	No. of animals (blood serum)		Result	No. of animals a: sample of faeces b: sterile autopsy c: blood serum			Result	No. of animals a: sample of faeces b: helminthol. autopsy c: blood serum			Result
Category III. (BEM)	236		100 % negative	a	1200		100 % negative	a	1200		100 % negative
				b	240		100 % negative	b	240	S. muris (caecum)	0.6 % positive
								c	160	Toxo-plasma	100 % negative
Category II. (BEM)	200	Sendai	56.7 % positive	a	400		100 % negative	a	400	S. muris	11.5 % positive
		PVM	86.5 % positive	b	80	P. ureae	80 % positive	b	80	S. muris (caecum)	65.7 % positive
		MHV	0.7 % positive							Tritricho-monas muris (caecum)	6.7 % positive
								c	160	Toxo-plasma	100 % negative
Category I. (BEM)	200	Sendai	14.3 % positive	a	369		100 % negative	a	454	S. muris	11.2 % positive
		PVM	41.1 % positive	b	56	P. pneumo-tropica	92.8 % positive	b	56	S. muris (caecum)	48.2 % positive
		Toolan	1.8 % positive			P. ureae	10.7 % positive			T. muris (caecum)	21.4 % positive
						B. bronchi-septica	7.1 % positive	c	160	Toxo-plasma	10.0 % negative
						S. aureus	14.3 % positive				
						S. monili-formis	12.5 % positive				
						Myco-plasma	37.5 % positive				
outside breeding colonies	47	Sendai	10.6 % positive	b	9	P. pneumo-tropica	44.4 % positive	a	11	S. muris	36.4 % positive
		PVM	4.3 % positive			P. ureae	11.1 % positive	b	9	S. muris (caecum)	33.3 % positive
		KILHAM	14.9 % positive			S. aureus	33.3 % positive			T. muris (caecum)	11.1 % positive
		MHV	2.1 % positive			B. bronchi-septica	11.1 % positive				
				c	4	leptospira	100 % negative				

the breeding system is open or closed. The term "open" may be also applied for a breeding in which "mere" transplantations – skin grafts – are performed.

5. Even in the first category the differences prove the dependency on hygienic conditions.

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