N-AB 355 (Clenbuterol) A New Sympathomimetic for Treatment of Respiratory Tract Diseases in Pigs
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Introduction
A few years ago, the respiratory tract diseases in pigs, in particular enzootic pneumonia as a growing-reducing disease, seemed to meet with still greater interest than today. On the one hand, this is surely due to the fact that other infections and growing-reducing diseases have gained significance while the situation of respiratory tract diseases has slightly improved due to practiced hygiene, prophylaxis and SVP-programmes. On the other hand, the shifting of therapeutic interest could be based on the experience that administration of pharmaceuticals essentially that of antimalarial substances frequently had only a slight or no success at all. In the following is presented a substance which – due to its effect on the symptoms of chronic respiratory diseases as well as the possible improvement of the respiratory function and the ventilation conditions in the total monochromatobranchial tract may be suitable as alternative to conventional therapeutic measures.

Pharmacology
N-AB 355, Clenbuterol (Cl.) is a 4-aminophenylisopropyl-(-)-5,6-dihydroxypseudoephedrine hydrochloride. The substance shows clearly several activities of a different nature, all more or less interesting for the therapeutic activities of the classical property of this group of substances is their pronounced:

1. buccal mucous resp. bronchial stimulating activity
   The stimulation released by Cl. is comparable to that released by isoprenaline.

2. secretolytic activity is even stronger than in distillation products of turpentine. Cl. stimulates the lysozyme system of the bronchial mucosa, whereby the secretion is loosened intercellularly and due to the intensified production transported away more easily. A further factor cooperating with the secretolytic and furthering expectoration is the

3. activation of the ciliary function. This enhancement of the ciliary movement is expressed by the increase in frequency of the latter as well as by acceleration of the removal of mucus. Tough, stagnant secretion is loosened more easily from the walls of bronchi and bronchioles and removed more quickly. Furthermore, Cl. exercises a distinct

4. protective action upon the mast cells. In allergic, pathogenic mechanisms the substance impedes even in bronchially extremely sensible release of mediator substances. At first was proved by experiments the inhibition of histamine liberation as consequence of mast cell degeneration under the influence of the antigen-antibody reaction in the dextran and egg albumin guinea in the rat. Later could be reached absence of symptoms in man in the acetycholine and histamine provocation test under Cl.-protection. Beside by these pharmacologic qualities, Cl. distinguishes itself by its pharmacokinetic properties. It possesses an

5. extremely good oral resorability amounting to approx. 100 % while it is independent from the species and a

6. long duration of action. This is caused by the special metabolic stability of the Cl.-molecule and the fact that it is bound extremely strongly to the β-receptors of the muscle fibers and via this way it is possible to reach with Cl. a much longer duration of action than with comparable substances.

Clinic
Cl. is used in human medicine and also – very successfully – in veterinary medicine. Pulmonary function tests in treated horses, in which were proved dropping of the interstitial pressure, decrease of resistance, rising of respiration and increase of the vital capacity, objectify the positive clinical impression in the same way as do blood gas analyses, which resulted in clearly more favourable Ω-values and endoscopic controls in increased secreteability and improved expectoration. It is interesting that a considerable decrease of respiration was also found in clinically healthy animals.

First orienting test-treatments in pigs with enzootic-pneumonia (RP) point out that, above all, the symptom cough can be influenced favourably by Cl. Moreover, there exists the clear impression that the increasing well-being of the treated animals manifests itself by enhanced appetite, favourable development of their weight and decreasing losses.

Presently running pulmonary function tests are meanwhile verifying the Cl.-activity. In the future, profitability tests proving the usefulness for the animal owner, are presently running in various European countries and in Mexico.

Conclusions