

## **Technological Stress Prevention to Nutria (*Myocastor coypus*)**

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### **Abstract**

Animal grouping, groups restructure, changing the docks and various technological operations causes disorders to the nutria manifested by aggressive behaviour. Tranquilizers prevent the stress and lower the catecholamine's levels. In a number of 300 individuals grouped into four groups (one control group and three experimental groups) was surveyed the effect of Promazine (20 mg/kg, experimental group I), Diazepam (15 mg/kg, experimental group II) and Nitrazepam (15 mg/kg, experimental group III) administration for preventing stress and aggression resulted from various technological operations. Grouping animals and groups restructure generates behaviour disorders manifested by acute aggression, maximum within 4-6 hours and maintained for 24-36 hours. In the three experimental groups the intensity and frequency of aggressive acts decreased near zero, with greater efficacy in experimental group II and III. Duration of cataleptic effect was 3-7 hours (experimental group I), and 8-12 hours in the other two experimental groups, covering the period in which aggression is greatest. Waking up is done in 2-3 hours, moment at which the behaviour is almost that of an old group. The negative consequences of groups restructure, transport and other technological disturbing measures can be prevented by animal's tranquilization, and the three substances investigated had an efficient preventive effect.

**Keywords:** aggression, behaviour, nutria, stress, tranquilizers.

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### **1. Introduction**

Animal grouping, groups restructure, docks changing, feeding space limitation causes on nutria of all ages an aggressive behaviour. Consequences of regrouping, transport and other technological manoeuvres are diverse, ranging from traumatic superficial injuries to muscle contusions, haematomas, lacerations of the coat, variable sizes of depilated areas, weight gain loss, extending the period of physiological recovery after weaning, delayed entry into oestrus, repeated mating, reduced fertility, embryonic or foetus abortions [1].

Behavioural improvement it can be achieved with anti-stress medication, whose main goal is prevention [2, 3].

Initial anti-stress treatment includes mainly feed mixtures, premixes or medicinal mixtures administered both orally and by injection, in which were also included antibiotics and chemotherapeutics. These substances were blamed lack of selectivity and for their involvement in creating an imbalanced microbiota. Also, this type of medication, pharmacodynamically speaking, does not correspond to an anti-stress medication and just prevents the microbial invasion in conditions of weaker defence forces of the body caused by stress [4]. This medication targets are not the ethological mechanisms of stress, it is addressed to the consequences control. Tranquilizers, leading to inhibition of subcortical structures, reduce anxiety, agitation and aggression, and by their neuroleptic component part prevent stress and lower adrenocortical response, respectively catecholamine's excess [2, 5].

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From bibliographic synthesis on the subject matter, result that in the current nutria growth and operating systems, anesthesia is a necessity to solve medical and animal breeding technology problems. Since in the literature lacks evidence on this subject it was considered necessary to undertake research in this regard.

## 2. Materials and methods

The research was conducted on 300 adult individuals of both sexes divided into four groups as follows:

- control group – 75 individuals;
- experimental group I - 75 individuals who received orally in feed (mixed fodder) Promazine in a dose of 20 mg/bw;
- experimental group II - 75 individuals who received Diazepam 15 mg/bw orally in feed;
- experimental group III - 75 individuals treated with Nitrazepam 15 mg/bw, administered in feed.

We followed the effect of Promazine, Diazepam and Nitrazepam in the prevention of stress and aggression resulted from various operations with technological character (strokes, regrouping, transportation, weighing, vaccines, pregnancy control). The animals were subjected to treatment with 1-11/2 hours before grouping or transport.

Animals were divided in groups of 75 individuals. Each group had an identical living space and interior fittings.

The transport was done in cages with dimensions of 0.4 m width /1.50 m long by groups of 5 individuals who received the same medication.

Clinical pharmacodynamic and anesthesiological effects were followed for 48 hours and were assessed by performing clinical general examination, following standing and walking, individual and group behaviour, testing main proprioceptive spinal reflexes, exteroceptive (patellar, abdominal, vulvar and anal), bulbo-pontine (corneal, palpebral, pupillary) and statokinetic reflexes, pain sensitivity and response to acoustic stimuli.

All procedures were carried out under full protection of the animals according to the European agreements signed by our country (Directive UE 93/35/EEC, amendment 76/768/EEC, directive 86/609 CEE), with the Romanian law (Law 471/2002, ruling 37/2002) and with the own regulation of USAMVB

Timisoara regarding the unfolding of the research experiment on live animals.

The sedative and relaxing cataleptic effects were appreciated by making various manoeuvres restraining, handling and clinical explorations of nutrias.

It was timed the period of initial effect occurring, time to the maximum effect, duration and overall effect. The intensity of overall anesthetic effect was assessed taking into account both clinical and anesthesiological criteria (analgesia, immobilization, sedation and hypnosis). We have established conventional four degrees of inhibition:

I - mild sedation without modification of reflectivity and reaction to pain and acoustic stimuli, quadruped position, normal movement;

II – medium sedation, reduced reflectivity and reactivity, normal decubital and standing position, difficult and uncertain movement, unresponsive facies;

III - deep sedation, general reflectivity and reactivity to noise and pain stimuli obvious diminished, indifference to the environment, difficult standing position, sterno-abdominal decubital position with head on the floor, difficult movement, sometimes impossible, ataxia, hypokinesia, drowsy facies;

IV – hypnosis, general reflectivity strongly diminished, sterno-abdominal or lateral decubital position, astazia and ataxia, impossible movement and satisfactory analgesia (according to the drug).

Data were analyzed using t- test, comparisons were considered significant at  $p < 0.05$ .

## 3. Results and discussion

In the control group within 24 hours was observed a number of 185 clashes conflict “Figure 1”, significantly higher compared with experimental groups, of which 25 of maximum intensity requiring personnel intervention, 2 cases required necessity slaughtering.

Fighting duration in the first 4-6 hours is longer than 3-5 minutes, usually ending with the abandon of one individual, the other continued to show aggression to other individuals. After 6 hours the incidence of aggressive acts and violence decreases and occurred the aggressors’ recognition by weaker individuals who keep away from them. At 10 hours was noted a resurgence of conflict cases that appeases gradually.

In all three experimental groups the intensity and frequency of aggressive acts decreased near zero with greater efficacy in groups III and IV, respectively under diazepam and nitrazepam. Differences between experimental group III and IV ( $p=0.243$ ) and group II and IV ( $p=0.079$ ) were statistical insignificant, but significant between group II and III ( $p=0.019$ ).

In experimental group II the use of promazine in a dose of 20 mg/kg produces a mild ataxia, reduced motility and voluntary adoption of a sterno-abdominal physiological decubital position with open eyes, attitudes which correspond to a sedation grade II/III. The duration of effect is just 3-7 hours, covering the period in which violence of aggression is maximal. Within first 4 hours the frequency of clashes conflict was 5, with very low intensity. Basically there were no injuries during the first 4 hours.

When neuroplegic effect of promazine passes the integration of individuals in community is relatively easy. With a contact time of 4 hours and uniformity of smell the number of conflict contacts is much reduced. Within 4-12 hours were recorded 35 mild fights, having duration of 5-60 seconds, 24 contacts were limited to an adoption of browbeating postures. After 24-36 hours aggressive actions have not been registered.

In the experimental groups III and IV the behaviour after treatment was very similar, recording a state of catalepsy lasting 8-12 hours. The motility was abolished, the subjects of the group crowded in smaller groups formed of 20-30 individuals in a corner, take a sterno-abdominal decubital position, with eyes closed and showing all the characteristic reactions of a state of apparent physiological sleep - the intensity of overall anesthetic effect was assessed as grade III/IV. The presence of people in the dock or unusual sounds is perfectly tolerated with no reaction.

Awakening is slow and occurs in 2-3 hours, moment at which behaviour is almost that of an old group. The number of conflicts within 0-12 hours time interval was zero, and within 12-24 hours in group III - 13, and in group IV - 12. There was not observed phenomena of the penis relaxation or other side effects. In any one of the

two groups after 24 hours injuries were not observed.

Males' sexual behaviour remains unaffected after 24 hours of the treatment with all of the three neuroleptics.

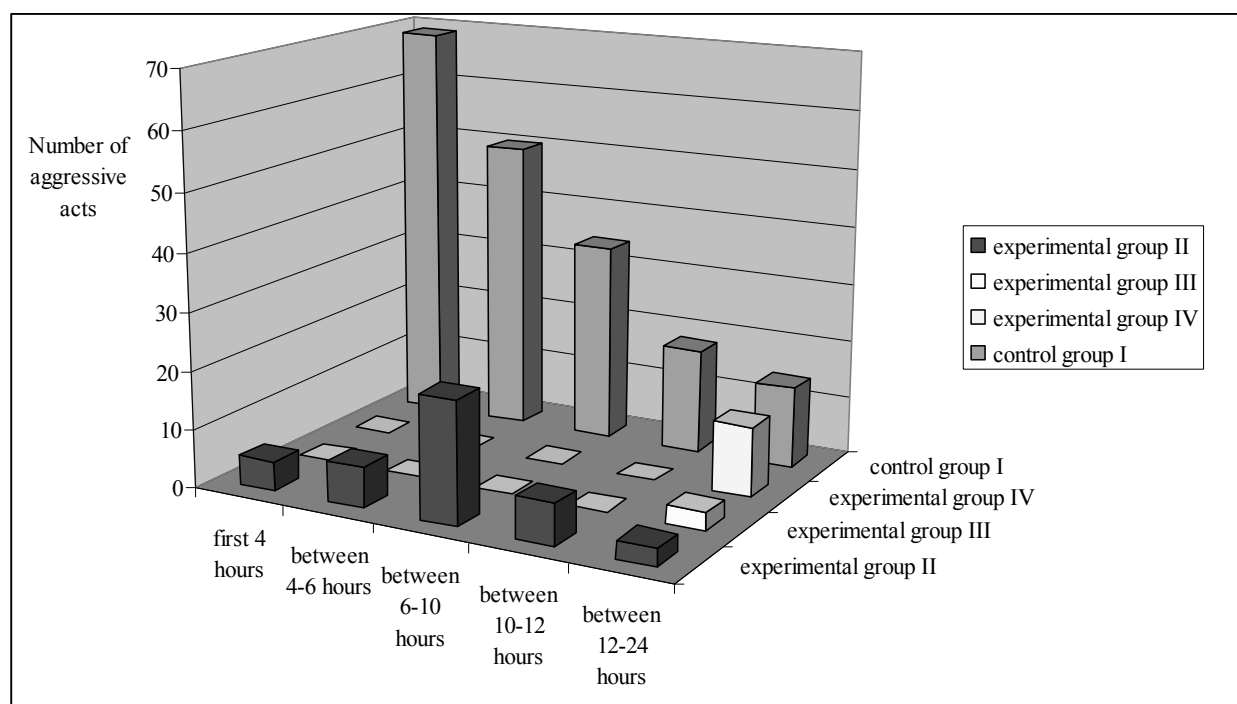
Research has gone on line the use of medicinal substances that has a favourable influence on nutrias' behaviour, and their administration does not need additional restrain handling. The use of neuroleptics and tranquilizers in the feed should be made very careful, in pursuit of as uniform mixing.

Our results indicate that nutria has a similar behaviour to other small animal species when tranquilized [2, 6, 7, 8].

Phenothiazine neuroleptics have constantly neuroleptic effect, but have the disadvantage of long lasting effect, 3-7 hours in our study, also recorded in other species [2, 6, 7, 9]. For transport and for some handling (pregnancy control, individualization, performing clinical examination), promazine administration in a dose of 20 mg/kg per os provide maximum security conditions and an efficient neurovegetative protection. Benzodiazepine derivates have long-term calming effect, 8-12 hours in our study and greater than phenothiazine derivate promazine, on high doses setting up a state of deep sedation to hypnosis.

The exploitation conditions in large groups and periodic changes revealed that grouping and regrouping have negative psychological effects, manifested by acute aggression, state that continue for few days. Zooeconomical consequences consist in injuries, reducing weight gain, longer term physiological recovery after weaning and reproductive disorders. The negative consequences of regrouping transport and other disturbing technological actions can be prevented by animals' tranquilization.

Regarding drug means of response management to the action of the stressed factors results that investigated neuroleptics (promazine, diazepam, nitrazepam) have beneficial effects based on reduced nervous tension, physical overtax and aggressive behaviour removal in the early hours after regrouping or during transport, which coincides with of extreme aggression period.



**Figure 1.** Distribution of aggressive acts during the surveillance period (n=75)

#### 4. Conclusions

The acute aggressiveness results of grouping and regrouping, is maximum within first 4-6 hours and is maintained 24-36 hours, appearing as a manifestation of psycho-social behaviour motivated by the establishment and maintenance of order and hierarchy between individuals.

Investigated neuroleptics (promazine, diazepam, nitrazepam) have beneficial effects based on the nervous tension reduction, physical overtax and aggressive behaviour removal after regrouping in the early hours or during transport.

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