COMPARISON BETWEEN THE EFFICACY OF CHOSEN MIXED HERBAL PRODUCTS (C.M.H.) AND CHEMICAL DRUG (DICLAZURIL) AGAINST COCCIDIOSIS IN CHICKENS
Shalan, M.N. 1; M.A. Kutkat 2 and Nadia M.T. Abu El-Ezz 2
1- Medicinal and Aromatic Plants, Research Section, Horticultural Research Institute, Agricultural Research Center, Giza, Egypt.
2- Department of Parasitology and Animal Diseases, National Research Centre, Giza – Egypt.

ABSTRACT

This study was conducted from June 2004 to June 2005 to study the possibility of utilization of natural herbal medicinal plants (C.M.H.) instead of chemical ones such as diclazuril to overcome the serious disease of coccidiosis in chickens in Egypt. Experiment was conducted in parasite section, National Research Centre, Giza – Egypt.

The effect of some mixed herbal products (C.M.H.) which contains mixed of herbs of Artemisia annua 50%, Flaxseed 25% and curcumin 25% was studied for controlling the avian coccidiosis mainly (Eimeria acervulina, E.maxima and E tenella) as compared with chemical medicine (diclazuril).

Some primary treatments have been carried out as different structures which mixed of some herbal plants to choose the best of them as superior natural herbal structure to overcome serious coccidiosis diseases and weight gain in chickens in Egypt. The best group of different structures mixed herbal products which one kg of product composed of Artemisia annua 500 gm, flaxseed 250 gm and curcuma longa 250 gm comparing with remain other structures. This chosen group of mixed herbal products used against coccidiosis in chickens in comparison between efficacy of this natural product and chemical drug (Diclazuril).

Six equal groups of chickens were used in this study, as follows:
1- First and second groups of chickens were treated with (C.M.H.) 1 and 2 kg / ton of nutrition respectively from one day of life.
2- Third and fourth groups of chickens were treated with (C.M.H.) 3 Kg / ton and 1 ppm of diclazuril respectively, from first day of life until the end of experiment.
3- Last two groups of chickens 5 and 6 were left as positive and negative control.
4- At 14 days of life, the groups of chickens of 1, 2, 4 and 5 were infected by 50,000 sporulated oocysts / bird.

Results of the experiment provided a promising results as followed:
• No mortalities were observed in chickens which treated by 2 Kg / ton of (C.M.H.), followed by 4% and 8% mortalities in treatments with 1 kg / ton of (C.M.H.) and 1 ppm of diclazuril respectively.
• Significant protection against lesion score (against coccidial infection) was observed by treatment with 2 and 1 kg / ton of (C.M.H.), respectively – comparing with diclazuril at 1 ppm.
• Weight gain was reached 288.4 and 259 / g in groups treated with 2 and 1 Kg of (C.M.H.) respectively, when 1 ppm of diclazuril reached to 267.1 gm / average weight gain against 227.3 g in non – treated infected group.
• Flushing result was observed when 3 Kg / ton of (C.M.H.) was used in non – infected chickens, while average of weight gain was reached to 314.2 g, against 264.9 g in non – infected non – treated group.
Shalan, M.N. et al.

- Oocyst shedding per g. of faecal dropping was decreased in groups medicated with (C.M.H.) at 2 and 1 Kg / ton while it was reached to 678.7 and 1018.5 oocyst / g. respectively, if compared with chemical diclormid, treated and non - treated groups (845.9 and 30867.5 oocyst per g.), respectively. This study showed that the use of (C.M.H.) gave a promising results in controlling of avian coccidiosis diseases Spp. especially E.acervulina, E.maxima and E.Tenella, besides, it obviously improved body weight and weight gain reached to 26.9 % and 38.2 %, when (C.M.H.) added to feed with 2 or 3 Kg / ton.

INTRODUCTION

Avian coccidiosis is an intestinal disease caused by protozoan parasites of the genus Eimeria which replicate within the epithelial cells of intestine (Shirley, 1986). The disease has a great economic impact in poultry production. The annual worldwide cost is estimated at about $ 300 million (Williams, 1993), however (Yun et al., 2000) reported that the annual losses reach to more than $ 1.5 billion. These estimates include the costs of prophylactic in feeds medication for broiler and layer breeders.

Coccidial oocysts are ubiquitous and easily disseminated in the poultry house environment and have such a large reproduction potential, it is very difficult to keep chickens coccidiosis free, specially under current intensive rearing conditions. Inspite of the improvement in management and hygienic conditions in poultry production in recent years, outbreaks of coccidiosis still occur.

The use of anticoccidial feed additives over the past 50 years has played a major role in the growth of poultry industry. These anticoccidials could be classified as (I) chemicals have specific mode of action against parasite metabolism such as amporolium and clopidol decoquinate and (II) polyether ionophore such as monensin, lasalocid and salinomycin which act through general mechanisms of altering ion transport and disrupting osmotic balance (Jeffers, 1997). However, the development of anticoccidial resistance has threatened the economic stability of the poultry industry (Chapman, 1994 & 1998 and Ruff and Danforth, 1969). Live vaccines for coccidiosis control have been used to a limited degree by the poultry industry for about 50 years. Their effectiveness depends on the recycling of initially doses of oocyst and gradual build up of solid immunity (Shirley et al., 1995) they had been used primarily to protect the breeder and layer flocks. In broilers the live vaccine required careful determination of the dose to avoid depressing effect on the growth performance (Abu-El Ezz et al., 2000).

Different types of substances had been investigated to search on the alternative method for controlling the coccidiosis. A number of natural products have been tested as anticoccidial dietary additives (Allen et al., 1998). Sources of fats containing of n-3 fatty acids (n-3 FA) such as fish oils, flaxseed oil and whole flaxseed, when added to starter rations from one day of age, effectively reduced lesions resulting from challenge with E. tenella but not E. maxima (Allen et al., 1998). Curcumin (0.05%), appear to be effective in reducing upper- and mid small intestinal infections caused by E. acervulina and E. maxima (Allen et al., 1998), but not beneficial for E. tenella infections. Other traditional medicinal plants were applied by (Allen et al., 1998).
The present work aimed to evaluate the effect of active principals, α-linolenic acid, artemisinin and curcumin in herbs Flaxseed, Artemisia annua and Tumeric, respectively, in combination for controlling the coccidiosis and weight gain in chickens as compared with diclazuril; for final goal to use natural herbal products instead of chemical ones to protect the health of human and prevent environmental pollution. In addition, this work examines some documented alternative natural products that have shown some useful properties either by controlling Eimeria or through improving the animal's ability to resist the disease.

MATERIALS AND METHODS

Parasites:
Local field of mixed Eimeria species that infect different sections of the intestine mainly as *E. acervulina* (duodenum) *E. maxima* (mid part) and *E. tenella* (cecum) was used. Chickens were inoculated at age of 2 weeks with 50,000 sporulated oocysts/chicken.

The effective medicinal components of materials under studied have been analyzed and estimated in Chemistry Section laboratory of Mansoura Agriculture College.

Evaluation of medically active components of these spices are:
- 100 gm of Artemisia annua contains 0.800 gm of artemisinin.
- 100 gm of Flaxseed contains 18.25 gm of α-linolenic acid.
- 100 gm of Curcuma longa contains 0.05 gm of curcumin.

Edicaments:
(C.M.H.) contains the following ingredients per Kg:
- Artemisia annua 650 gm contains 3 gm of artemisinin.
- Flaxseed (250 gm) contains 48.125 of α-linolenic acid.
- Tumeric (250 gm) contains 0.125 gm of curcumin.

Experimental Design:
(1) Primary experiment
It was carried out to prefer the better of different combinations which they composed of three herbs at different amounts against coccidiosis diseases in chickens. These herbs are Artemisia annu, Flaxseed and Tumeric and they are recognized as anti-parasites. The primary experiment contains five treatments and each of them included 50 chickens one day old.

Treatments contained:
- T1: 1 kg/ton [Artemisia annu (A) + Flaxseed (F) + Tumeric (T)-500 + 250 + 250(gm)] respectively Inf. Treated.
- T2: 1 kg/ton [A + F + T- 250 + 500 + 250(gm)] respectively Inf. Treated.
- T3: 1 kg/ton [A + F + T- 250 + 250 + 500(gm)] respectively Inf. Treated.
- T4: 1 kg/ton [A + F + T- 333.3 + 333.3 + 333.3(gm)] respectively. Inf. Treated.
- T5: 1 kg/ton [A + F + T- 500 + 250 + 250(gm)] respectively. Inf. and non-Treated. Inf.

Chicks infected with Eimeria of coccidiosis.
Treated: Addition of different mixtures of herbs with different doses to feed of chicks.
Chief experiment

A total of 180 one-day-old egg laying chicks (Lohman) were used in the experiment. The chicks were divided into 6 groups (1-6) 30 chicks each. The birds were fed on starter ration free from anticoccidial drugs. First, second and third groups were treated with (C.M.H.) at the levels 1, 2 and 3 kg/ton, respectively. Birds in group 4 were treated with (1ppm) diclazuril in ration. Groups number 5 & 6 were kept as infected non treated and non infected non-treated control groups. At 14 days of age chicks in groups 1, 2, 4 and 5 were inoculated by 50000 sporulated oocysts of mixed Eimeria spp., but group (3) did not inoculated.

Measurements to evaluate the efficacy of (C.M.H.) as anticoccidial drug were: mortality rate; body weight; weight gain and lesion score at day 5 post infection (pi) (Johnson and Reid, 1970). The percentage of protection against mean lesion was calculated after (Singh and Gill, 1976). In addition, the total oocysts output/g. of fecal dropping were estimated for each infected group of chickens using Mac-Master slid technique (Gordon and Whitlock, 1939). Chicks were individually weighed at one-day-old, 2 weeks old (day of infection) and at the end of experiment. Statistical analyses were carried out by Duncan’s multiple range test (Duncan, 1955) which used to detect the significant differences between means. The statistical design of experiment was complete randomized blocks, with three replicates.

RESULTS

Data of primary experiment tabulated in Table (1), explained that, the first treatment, 1 kg of mixture contains 500 gm Artemisia annua + 250 Flaxseed + 250 gm Tumeric herbs, realized most achievement of superior results comparing with others. Differences were statistically significant comparing treatments with control in T5. So, mixture of T1 was chosen than others to start the chief experiment to compare between the efficacy of some mixed herbal products and chemical drug (diclazuril) against coccidiosis in chickens.

In chief experiment obtained results are represented in tables (2-4). As shown in Table (2), the mortality percentage in infected non treated group (G5) was reached to 24%, while it was 8% and 4% in chicks which medicated by diclazuril and (C.M.H.) 1 kg/ton in groups 4 and 1 respectively. No mortalities were recorded in chicks which received (C.M.H.) as 2 or 3 kg/ton. The protection against mean lesion score was reached to 75.75, 100 and 97.5% in chickens which medicated with diclazuril and (C.M.H.) 2 & 1 kg/ton respectively.

Regarding to lesion score in intestine it was found that there is a significant reduction in lesion score in the duodenum and cecum in all infected treated groups if compared with non treated one, while it was reached 1,000; zero and 1,000 in groups 1, 2 and 4 respectively. RESULTS in Table (2) showed that a significant reduction in lesion score in groups 1 & 2 comparing with group 4. On the other hand, there is a significant protection against lesion score in group 4, if compared with group 5.
The comparative effect between (C.M.H.) and diclazuril on weight gain of coccidial infected chickens was clarified in Table (3). It was found that the addition of 2 kg/ton from (C.M.H.) (Gr2) gave a promising result; while the weight gain was reached 288.4 g. comparing with 250.0 g. when 1 kg/ton of (C.M.H.) was used (Gr1) and 267.1 g. when 1 ppm of diclazuril was used against 227.3 g. in infected non-treated control group. A flashing result was shown when 3 kg/ton of (C.M.H.) was used in non-infected chickens, while the weight gain reached 314.2 g. (Gr3) against 254.9 in non-infected non-treated control group (Gr4).

Results of body weight were clarified in Table (3). The body weight at 2 and 5 weeks was significantly increased in group (2) if compared with other infected treated groups. It reached 210 g. in Gr2 against 200.3; 2.30 and 198.0 in group 1, 4 and 5 at day of infection respectively (Table 3). After 3 weeks post-infection (5 week old), there was a significant difference between all groups. In group 2 (C.M.H.) significantly protected weight gains. It reached 327.1 against 305.2 and 265.8 g. in diclazuril treated and nontreated groups, respectively comparing in non-infected chicken groups.

The (C.M.H.) provided a significant mean body weight gain (352 g) in group 3 if compared with (293 g.) in non-infected non-treated control (group 6).

Table (1) : Comparative effect of different herbal compounds and coccidial infection on mortality %, lesion scores, protection % and weight gains/gm in chicks.

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Treated with herbs</th>
<th>Infection with Eimeria sep.</th>
<th>Mortality %</th>
<th>Lesion scores</th>
<th>Protection %</th>
<th>Weight gains/gm</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>+</td>
<td>+</td>
<td>4.0</td>
<td>0.800 ± 0.430</td>
<td>97.25</td>
<td>258.0</td>
</tr>
<tr>
<td>T2</td>
<td>+</td>
<td>+</td>
<td>10.0</td>
<td>1.200 ± 0.673</td>
<td>82.62</td>
<td>250.6</td>
</tr>
<tr>
<td>T3</td>
<td>+</td>
<td>+</td>
<td>14.0</td>
<td>1.534 ± 0.576</td>
<td>78.66</td>
<td>246.1</td>
</tr>
<tr>
<td>T4</td>
<td>+</td>
<td>+</td>
<td>13.0</td>
<td>1.956 ± 0.646</td>
<td>74.38</td>
<td>240.8</td>
</tr>
<tr>
<td>T5</td>
<td>-</td>
<td>+</td>
<td>26.0</td>
<td>3.000 ± 0.574</td>
<td>26.00</td>
<td>227.3</td>
</tr>
</tbody>
</table>

- T1 : 1 kg/ton [Artemisia annu (A) + Flaxseed (F) + Turmeric (T)-500 + 250 + 250/gm] respectively. Inf. Treated.
- T3 : 1 kg/ton [A + F + T-333.3 + 333.3 + 333.3/gm] respectively. Inf. Treated.

Inf. : Chicks infected with Eimeria of coccidiosis.
Treated : Addition of different mixtures of herbs with different doses to feed of chicks.

5837
Result in table (4) showed the comparative effect of dietary (C.M.H.) and diclazuril on output of *Eimeria* spp. Oocysts of faecal dropping in different chicks groups. It was found that the shedding of oocysts per g. of faecal dropping decreased in groups which medicated by (C.M.H.) (2 & 4 kg/ton) while it reached 678.7 and 1018.5 oocyst/g, respectively if compared with groups which medicated with diclazuril and nontreated group while it reached 8459 and 30867.5 oocyst/g, respectively. All results in treatments were compared with obtained in (Gr8).

Table (2): Effect of diets supplemented with (C.M.H.) or diclazuril on mortality, lesions score and protection percentages against lesion scores of chicken infected with *Eimeria* spp.

<table>
<thead>
<tr>
<th>Gr No.</th>
<th>Treatment</th>
<th>Infection with <em>Eimeria</em> spp.</th>
<th>Mort. %</th>
<th>Lesion scores</th>
<th>Total mean</th>
<th>Prot %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chicken fed C.M.H. 1 kg/ton</td>
<td>+</td>
<td>4</td>
<td>1.00*</td>
<td>1.00*</td>
<td>0.400</td>
</tr>
<tr>
<td>2</td>
<td>Chicken fed C.M.H. 2 kg/ton</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Chicken fed C.M.H. 3 kg/ton</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Chicken fed diclazuril 1 ppm</td>
<td>+</td>
<td>8</td>
<td>1.00*</td>
<td>1.333*</td>
<td>0.556</td>
</tr>
<tr>
<td>5</td>
<td>Chicken infected non treated</td>
<td>+</td>
<td>24</td>
<td>3.000*</td>
<td>3.000*</td>
<td>0.577</td>
</tr>
</tbody>
</table>

1. C.M.H.: Chopped mixed herbal products.
2. D: Duodenum.
3. M: Mid part of intestine.
4. C: Cecum.
5. Prot.: Protection.
6. Mort.: Mortality %

Table (3): Comparative effect of (C.M.H.), Diclazuril, and coccidial infection on chicken weight gain (g).

<table>
<thead>
<tr>
<th>Gr No.</th>
<th>Body weight (X± S.E)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 day old</td>
</tr>
<tr>
<td>1</td>
<td>38.8± 0.709</td>
</tr>
<tr>
<td>2</td>
<td>38.7± 0.558</td>
</tr>
<tr>
<td>3</td>
<td>38.5± 0.281</td>
</tr>
<tr>
<td>4</td>
<td>38.1± 0.460</td>
</tr>
<tr>
<td>5</td>
<td>38.6± 0.423</td>
</tr>
<tr>
<td>6</td>
<td>38.8± 0.746</td>
</tr>
</tbody>
</table>

Different letters of means in the same column show significant difference at p < 0.05.

5838
Table (4): Comparative effects of dietary (C.M.H.) and diclazuril on Eimeria spp. oocyst (OPG) of faecal dropping in different groups of chicks.

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean oocyst count (10^6) of faeces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gr1</td>
</tr>
<tr>
<td>1-5</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>167</td>
</tr>
<tr>
<td>9</td>
<td>2795</td>
</tr>
<tr>
<td>10</td>
<td>3130</td>
</tr>
<tr>
<td>11</td>
<td>1345</td>
</tr>
<tr>
<td>12</td>
<td>940</td>
</tr>
<tr>
<td>13</td>
<td>705</td>
</tr>
<tr>
<td>14</td>
<td>648</td>
</tr>
<tr>
<td>15</td>
<td>336</td>
</tr>
<tr>
<td>Total</td>
<td>10185</td>
</tr>
<tr>
<td>Mean</td>
<td>10185</td>
</tr>
</tbody>
</table>

DPI: day post infection.

DISCUSSION

Coccidiosis is regarded as the parasitic disease that has the greatest economic impact on poultry production.

The increase resistance of avian coccidia to anticoccidial drugs currently used by the poultry industry has stimulated the search for new methods of control. In the last decades plant extracts were widely used for the controlling of avian coccidiosis and improving poultry performance world wide. (Matris, 1995; Allen et al., 1997a & 1997b; Allen et al., 1996; Allen et al., 1998; Allen et al., 2000; Young and Noh, 2001; Massoud et al., 2004 and Abu El-Ezz, 2005).

This study was planed to study the effect of (C.M.H.) as a mixed herbal products for controlling avian coccidian spp. mainly E. acervulina; E. maxima and E. tenella. Diets supplemented with (C.M.H.) from one day old until the end of experiment provided significant protection against lesion scores of coccidial infection (Table 2) and protect weight during infection with 50,000 oocyst from field strains of Eimeria (Table 3), as well as reducing the oocyst output of Eimeria in faecal dropping if compared with diclazuril 1 ppm or non infected non treated control group. The obtained results may be due to the effect of (C.M.H.) components and their chemical constituents for possible use as a prophylactic feed additives. Allen et al., (1997a) found that, when fed over a period of 3 weeks at a level of 5%, a dried leaf supplement of A. annua produced significant protection against lesions due to Eimeria tenella but not Eimeria acervulina or Eimeria maxima. Artemisinin is isolated from Artemisia annua; it is naturally occurring endoperoxide with antimalarial properties (Allen et al., 1997). It has been effective in reducing oocyst output from both E. acervulina and Eimeria tenella infections when fed at levels of 8.5 and 17 ppm in starter diets (Allen et al., 1997a and b). The mode of action of artemisinin has been attributed both to its potential to induce a state of oxidative stress through the free radical cascade generated by the endoperoxide function (Krungkrai and Yuthovong, 1987; Levander et al., 2005).
Shalan, M.N. et al.

1989; Mesniiok et al., 1989), and to the ability of the free radical to alkylate protein (Yang et al., 1994).

Our results in Table (2) were agree with the finding of (Allen et al., 1995) they found that curcumin (0.05%), appear to be effective in reducing upper-mid and small intestinal infection, caused by *E. acervulina* and *E. maxima*. The medichalaly active component, curcumin, a phenolic compound shown to have antioxidant and anti-inflammatory properties.

Regarding to the role of flaxseed in controlling of coccidiosis in chickens; several investigators (Fawcett et al., 1989; Levander et al., 1993) have shown that feeding diets high in n-3 fatty acids (n-3FA) is protective against protozoan infection due to oxidative stress induced by oxidation of the highly unsaturated fatty acids that had been incorporated into host tissues and cells of the parasite. Diets supplemented with n-3FA from menhaden oil and expressed flaxseed oil when fed to broilers from one-day-of age through 3 week will significantly reduce cecal lesion caused by *E. tenella* through reduction the development of parasite within the cecal mucosa (Allen et al., 1996 and 1998).

**RECOMMENDATION**

It can be concluded that the use of (C.M.H.) had a promising result and field trials must be undertaken for confirmation these results. Breeders of poultry can use (C.M.H.) as a natural medicine to prevent coccidiosis disease in poultry and to cause increasing of weight gains 13.14 % and 23.26 % when it was added with 2 and 3 Kg / ton to feed, respectively. Authors suggest to call choosed mixed herbal group (C.M.H.) - COX,HERB,SHAN.

**REFERENCES**


5840


مقارنة تأثير مخلوط بعض النباتات الطبية والمركب الكيميائي (الديكولازول) على طفيلي الكوكسديميا في الدواجن

محمد ناجي شلالان، محمد عبد العزيز خطاف، ونادية محمد طلعت.
1- مركز البحوث الزراعية – معهد بحوث الصيادلة – قسم بحوث النباتات الطبية والعلاجية.
2- المركز القومي للبحوث – قسم الطفيليات وأمراض الحيوان.

تم إجراء البحث بقسم الطفيليات وأمراض الحيوان بالمركز القومي للبحوث بالجيزة-
الفترة في الفترة من يونيو 2004 حتى يونيو 2005 ورئيزة تأثير خليط من عشب الأرقطية أقرب بنسبة 50% وشر كناف 25% وشر كرمة 25% ومكونية مع شر راوة الكيمياوي الشائع الاتصال والحرف بحم الديكولازولز على مكونات التفاعل الإصابة أشر بيني في سوق الكوكسديميا الطفيلي المتراضي في عرب skinsyra ولعبت أيضا دورا كبيرا في أنماط طب الجلد والمصابة، وعندما تبينا نتائج هذا البحث، تم تأكيد قدرة هذا المخلوط على الحماية غير السامة في جميع أنواع الدواجن.

واجريت الدراسة على سلسلة مجموعات من الطيور حيث تم تسمية المحمولات كالآتي:

المجموعة الأولى: تلقى علاج مخلوط الأشجار بمعدل 1 كجم/طن من مر اللفوم + عدي صناعي في عمر 14 يوم.
المجموعة الثانية: تلقى علاج مخلوط الأشجار بمعدل 2 كجم/طن من مر اللفوم + عدي صناعي في عمر 14 يوم.
المجموعة الثالثة: تلقى علاج مخلوط الأشجار بمعدل 3 كجم/طن من مر اللفوم + عدي صناعي.
المجموعة الرابعة: تلقى علاج ديكولازولز بتركيز 1 جزء في المليون من مر يوم + عدي صناعي في عمر 14 يوم.
المجموعة الخامسة: تلقى علاج طبيعاً أو كيميائي + عدي صناعي في عمر 14 يوم.
المجموعة السادسة: تلقى علاج طبيعاً أو كيميائي و بدون عدي.
وقد تمت مراقبة النتائج خلال 14 يوم للمجموعات 1، 2، 3، 4، 5، 6، و 50 ألف حيوينة ناجية في مراقبة النتائج من حيوانات الأرقطية التي تم عزلها من الخلل بينما تركت المجموعات.

5842
وقد تم تقسيم تأثير الملاجمة وفقاً لمعايير مختلفة وهي النسبة المئوية للنفوف، متوسط وزن الطاخر بالجرام، والزيادة في الوزن، النفوذ المعمر، والشيءехал، وككلكم عند الحيوانات التي تلتز في كل جرام من متوسط الملاجمة التي تمت عددها وذللك مقاسة بالمجموعات الضيقة، وقائمة بتقاييم ما يلي:

أولا: لم ينصح أي نفوذ في المجموعة الثانية التي تنتلت علاج مخاط الأعضاء، بمعمل 2 كغم/طن عدل فيما بلغ متوسط نفوذ 4% في المجموعة الأولى التي تلت علاج مخاط الأعضاء بمعمل 2 كجم/طن عدل عندما بلغ نفوذ 8% في المجموعة الثانية التي علوجت بالنيكلازوريل وذلك بمقارنتها بـ 24% نفوذ في المجموعة التي تمت عددها صناعياً ولم تتأثر.

ثانيا: سجلت نسبة الحلوة من الأكماجر الممرضة التي علاجت بـ 2 كجم/طن عدل و 92.5% في المجموعة الأولى التي علاجت بـ 1 كجم/طن عدل من مخاط الأعضاء، مقارنة بـ 70.8% في المجموعتين الثلاثيتي علوجت بالنيكلازوريل بينما كانت نسبة الحلوة 21% في المجموعة الخامسة التي لم تتأثر.

ثالثا: سجلت المجموعة الثالثة أعلى نسبة مئوية في زيادة غيرن حيث بلغ معدل زيادة 38.2% وذلك عند إضافه 2 كجم مخاط الأعضاء /طن عدل وبلغ معدل زيادة 17.5% في المجموعة الرابعة التي تم علاجها بالنيكلازوريل وكانت زيادة 13.9% في المجموعتين الأوليتي عند إضافه 1 كجم مخاط الأعضاء /طن عدل وذلك عند مقارنة المجموعات المذكورة بالمجموعة الخامسة التي تم قراءتها صناعياً ولم تتأثر أي نوع من العلاج.

رابعا: وفرت الملاحظات في معدل توزع الحيوانات في براح الأفراد حيث كان ترتيبه كالثاني في كل جرام من البراح.

- صغر في المجموعة الثالثة ( 3 كجم مخاط الأعضاء / طن ) ولم يتغير.
- 288.7 حفرة في المجموعة الثالثة ( 3 كجم مخاط الأعضاء / طن ) في صناعية.
- 298.0 حفرة في المجموعة الثانية ( 2 كجم مخاط الأعضاء / طن ) + صناعية.
- 459.5 حفرة في المجموعة الرابعة ( التي تم علاجها بالنيكلازوريل ) + صناعية.
- 459.5 حفرة في المجموعة الخامسة ( التي تم حفرها صناعياً ولم تتأثر أي علاج )

وقد تمت دراسة إلى فئات مالية مخاط الأعضاء المستعمل باسم كموديس، هيرب. شن ان تم توصيات الدراسة إلى أن استخدام مخاط الأعضاء للسماح لـ ( كموديس، هيرب ) يتمكن من قراءة 24% عند كموديس، هيرب عند تزايد كبير في معدل النمو النمو الأول الذي عرف تاريخ قياس على ممارسة عامة، كما يبدو على صحة الإنسان الذي يتزايد معالج معالج بالأعشاب الطبية الأثرية وحالياً من الكهربائيات كما أنه يضعف بيئة خالية من التلوث.

5843