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**CONTENTS**

**PURPOSE**

**The purpose of the Poultry Broiler Project was to establish whether or not there was any benefit (e.g. financial, income from saleable broilers, etc.) in dispensing Cell-Vet in the drinking water of broilers. This Poultry Broiler Report records the findings of the project.**

**Cell-Vet is an amazing oxygen mineral supplement, that increases oxygenation in the blood stream; improves digestion; and improves the immune system, the metabolism and the general well-being of a broiler. As a natural plant-based product, Cell-Vet is safe to use with all types of birds, and has been achieving excellent cost-effective results throughout the world, especially in the poultry industry in America, Japan and Mexico.**

**Cell-Vet is currently registered by the South African National Department of Agriculture as a Super-energized Oxygen Mineral Supplement (Registration Number V15885 – 2000.10.18) under the section "FARM FEEDS"; however, Cell-Vet should more correctly be classified as a nutroceutical, and will be reclassified as soon as it is possible to register it as such.**

**A very important part of this project was to observe the consequences or withdrawing all forms of vaccinations, anti-biotics and growth stimulants from a sample of broilers, and only replacing these items with Cell-Vet in their drinking water.**

**Cell-Vet is based on Cellfood, the world-leading oxygen mineral equivalent product for humans, that received the 1997 Advanced Technology Award from The International Hall of Fame in USA. Both products are manufactured by Nu Science Corporation in USA.)**

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**2. ASSUMPTIONS**

**2.1 That intensive farming of poultry has associated unique health and growth problems that could be addressed by dispensing Cell-Vet to the broilers on an ongoing basis, becoming part of standard veterinary flock health management.**

**2.2 That broilers living in restricted and densely populated houses, where there is a large amount of bird droppings, are probably exposed to abnormally high levels of ammonia, carbon-dioxide and air-borne pollutants; and, because of a lack of oxygen intake, suffer from a variety of lung and air-sac problems, as well as a variety of bacterial, viral, fungal, parasitical, etc. infections and infestations. This leads to high levels of stress and associated cardiovascular problems, resulting in high levels of mortalities and poor quality body mass.**

**2.3 That because many types of feed are becoming deficient of certain essential nutrients (due to escalating costs and growing mineral deficiency in soils), the broilers might not always receive all the nutrients needed (especially in the area of minerals, trace minerals, amino acids, and enzymes essential for optimal digestive functioning) for their optimal growth.**

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## 3. METHODOLOGY

To ensure objectivity and the most meaningful results, three broiler poultry sites in three different areas of South Africa were chosen (See APPENDIX 1 for Map of South Africa and Poultry Sites).

Cell-Vet was continuously dispensed into the drinking water of 51,216 broilers, from day-old stage to slaughter stage (39 – 42 days old). The one trial, at CLIFFORD ESTATE, continued until the broilers were 56 days old, in order to determine the long-term results of continuously dispensing Cell-Vet to broilers. Data capture was done primarily by the farmers; and a veterinary perspective, involving histopathological and dark-field microscopy analyses, was done by independent researchers.

At RAYNEL RANCH, two of four identical houses were selected as Trial Houses: House 2 was historically the worst producing house – an old house, using bell-drinkers; and House 3 was an average producing house – a more modern house, using nipple-drinkers. At the end of the trial, results showed that House 3 achieved the best overall results, with House 2 ending as a close second.

| # | Name of Farm | Location | Control House | Broilers on Cell-Vet |
|---|---|---|---|---|
| 1 | MP BADENHORST | BERGVILLE - Kwazulu-Natal Province | 3,134 | 1,566 |
| 2 | RAYNEL RANCH (2) | RUSTENBURG - North-West Province | 49,600 | 24,800 |
| 3 | RAYNEL RANCH (3) | RUSTENBURG - North-West Province | 49,600 | 24,800 |
| 4 | CLIFFORD ESTATE | HARRISMITH - Free State Province | 50 | 50 |
| 5 | TOTALS | | 52,784 | 51,216 |

See APPENDIX 2 : RAYNEL RANCH Broiler Farm.

See APPENDIX 3 : MP BADENHORST Broiler Farm.

On the three farms, various factors were monitored, and data captured. See APPENDIX 4 : Sample of Broiler Data Capture Form used on the farms during the project.

| # | Factor | Frequency of Data Capture |
|---|---|---|
| 1 | WATER CONSUMPTION | DAILY |
| 2 | MORTALITIES | DAILY |
| 3 | WEIGHT OF BROILERS | WEEKLY |
| 4 | FEED CONSUMPTION | END OF CYCLE |
| 5 | FEED CONVERSION RATION | END OF CYCLE |
| 6 | PERFORMANCE EFFICIENCY FACTOR | END OF CYCLE |
| 7 | INCOME FROM SALEABLE MASS OF BROILERS | END OF CYCLE |

Furthermore, a veterinary perspective was included in this project, and data captured:

| # | Factor | Frequency of Data Capture |
|---|---|---|
| 1 | RANDOM SAMPLES and POST-MORTEMS | AT START OF CYCLE; 2 WEEKS; & 4 WEEKS |
| 2 | BLOOD SAMPLES | END OF CYCLE |

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## 4. FARM ANALYSIS

All findings, e.g. from a financial and microbiological (macroscopic and microscopic) point of view, that are published in this report, will show clearly that there are cost-effective and ecological benefits from dispensing Cell-Vet on a continuous basis to broilers in intensive farming conditions.

### 4.1 WATER CONSUMPTION

Because Cell-Vet is dispensed into the drinking water of the broilers on a continuous basis, the monitoring of water consumption was critical to the success of this project. Furthermore, the quality of the drinking water was also important, to ensure that it was not hindering the effectiveness of the product. For this reason, water analyses were conducted.

**4.1.1 Water Consumption Schedule**

**APPENDIX 5 is an example of a WATER and Cell-Vet CONSUMPTION SCHEDULE that was developed for each farm (using a Microsoft Excel spreadsheet). Costs were also incorporated into this schedule so that each farmer could budget for the expenditure of Cell-Vet consumption. This schedule was modified on an on-going basis, depending on the actual water consumption of the broilers – as monitored using Data Capture Forms (APPENDIX 4). Water consumption depends to a large extent on the temperature in the house, and must be monitored at least twice a day in order to ensure that the correct amount of Cell-Vet is being dispensed into the drinking water.**

**4.1.2 Quality of Water**

**Of significant importance, is the quality of the drinking water being given to broilers. For this reason, the quality of the water was analysed.**

**APPENDIX 6 : Analysis of Borehole Water tested on two farms. The samples proved to be acceptable, apart from a small amount of coliforms present in the samples of water, and had no adverse effect on Cell-Vet in the water lines.**

**4.1.3 Dispensing Cell-Vet in Water Lines**

**In order to dispense a constant supply of Cell-Vet into the drinking water lines, two methods of dispensing were used.**

**4.1.3.1 Dosatron : non-electric proportional dispenser**

**Where possible, a Dosatron was used in order to dispense a constant supply of regulated Cell-Vet directly into the drinking water lines. This was used in the case of Bell-drinkers and Nipple-drinkers. The advantage of this system is that the mixture of Cell-Vet in the water line is constant, according to the ratio of Cell-Vet required in the water.**

**The disadvantage of this system is that Cell-Vet has to be diluted to some extent, because the Dosatron cannot work at the low dilutions required, e.g. 1:4,000. A possibility is to use two Dosatrons with the one feeding into the other, or to use an alternative proportional dispenser that can supply a ratio of 1:4,000; or even an electric proportional dispenser that can accurately dispense ratios from 1:2,000 to 1:4,000 into a water line.**

**See APPENDIX 3 for details of Dosatron dispensing system.**

**4.1.3.2 Water Storage Header Tank**

**Where it was not possible to use a Dosatron, e.g. water pressure too low, Cell-Vet was mixed in the water storage header tank that was feeding the drinkers of a particular house.**

**The disadvantages of this system are that the mixture can vary if it is not well mixed; one can forget to add more Cell-Vet from time to time; one can leave a valve on and so continue to over-dilute the product in the storage tank; one can forget to refill the storage tank and run the risk of losing broilers due to lack of water; and a mixture only sufficient for about 12 hours usage should be mixed at any one time. Therefore, this is not a recommended method of dispensing Cell-Vet because it is time-consuming and requires a certain amount of daily planning and administration.**

**See APPENDICES 2 & 3 for pictures of Water Storage Header Tanks outside broiler houses.**

**4.1.4 Water Drinkers**

**4.1.4.1 Bell-Drinkers**

**The advantage of this drinker is that one can easily see if it is operational. The position of water being drunk at a natural level also has advantages for the bird (see nipple-drinker below). The disadvantage of this drinker is that the water becomes contaminated and the bell-drinkers must be regularly cleaned, resulting in wastage of water and Cell-Vet.**

**4.1.4.2 Nipple-Drinkers**

**The advantage of this type of drinker is that the water does not become contaminated. The disadvantages are that it is not easy to see if all the nipples are operational, and the extended position can be stressful for the birds, causing them to drink less than required, resulting in dehydration and lowered body mass.**

**Concerning both drinkers, it is essential that sufficient drinkers be provided in the densely populated houses, especially when the temperature is kept at a constant temperature above 22°C.**

**4.1.5 Effect of Cell-Vet on Water Piping & Equipment**

**Because of the low pH of Cell-Vet (pH 0.5), tests were conducted to determine if there would be any adverse effect on the water piping systems and equipment.**

**APPENDIX 7 : Cell-Vet pH Analysis. Various dilutions of Cell-Vet in water were analysed. At a ratio of 1:2,000 the drop in pH is less than 5% and will have no adverse effect on any metal components used in drinking water lines and**

**equipment.**

**However, when Cell-Vet is used in a concentrated form, its pH is 0.5 and it would have a corrosive effect on metals if put into direct contact with them. Therefore, all parts of any dispenser or applicator, such as a Dosatron, that come into direct contact with Cell-Vet (i.e. before it is mixed with water), must be of plastic, polypropylene, nylon, etc. that are not affected by the low pH.**

**4.2 MORTALITIES**

**Throughout, there was a decrease in mortalities in the Trial Houses using Cell-Vet.**

| Farm | Control Houses | | | Trail Houses | | | Change % |
|---|---|---|---|---|---|---|---|
| | Total | Mort. | % | Total | Mort. | % | |
| MP BADENHORST | 2,967 | 212 | 7.14 | 1,133 | 48 | 4.23 | -40.76 |
| RAYNEL RANCH (2) | 49,600 | 5,590 | 11.27 | 24,800 | 2,560 | 10.32 | -8.43 |
| RAYNEL RANCH (3) | 49,600 | 5,590 | 11.27 | 24,800 | 1,228 | 4.95 | -56.08 |
| CLIFFORD ESTATE | 50 | 4 | 8.00 | 50 | 3 | 6.00 | -25.00 |

**Based on a cost of R1,15 per day-old chick, the savings for example at RAYNEL RANCH were:**

**House 2 : (5,590 divided by 2) minus 2,560 @ R1.15 = R 270.25**

**House 3 : (5,590 divided by 2) minus 1,228 @ R1.15 = R1,802.05.**

**These savings amounted to 1.43% and 9.53% of the cost of the Cell-Vet used in those houses (Assuming that 54 litres of Cell-Vet @ R350.00 per litre = R18,900.00 was used in each house. See Section 7 on COST-EFFECTIVENESS).**

**4.3 WEIGHT OF BROILERS**

**Throughout, there was an increase in the Weight of Broilers in the Trial Houses using Cell-Vet.**

| Farm | Control Houses | | Trail Houses | | Change % |
|---|---|---|---|---|---|
| | Total | AverageWeight | Total | Average Weight | |
| MP BADENHORST | 2,755 | 1.551 (42 DAYS) | 1,085 | 1.786 (42 DAYS) | +15.15 |
| RAYNEL RANCH (2) | 44,010 | 1.990 (42 DAYS) | 22,240 | 2.050 (42 DAYS) | +3.02 |
| RAYNEL RANCH (3) | 44,010 | 1.990 (42 DAYS) | 23,572 | 2.050 (42 DAYS) | +1.51 |
| CLIFFORD ESTATE | 46 | 2.275 (56 DAYS) | 47 | 2.936 (56 DAYS) | +29.00 |

**Regarding the trial at CLIFFORD ESTATE, all 93 broilers were weighed each time; whereas random samples were weighed at the other larger poultry sites. At CLIFFORD ESTATE, at 38 days, the average weights of the Control House and the Trial House were 1.520 and 1.630 kilograms respectively. The Trial House showed an increase in weight of 7.2%. When the broilers were weighed again at 56 days, the Trial House showed a remarkable increase in weight of 29.0%.**

**Refer to** Section 4.7 **INCOME FROM SALEABLE MASS OF BROILERS for more relevant information on what RAYNEL RANCH received for the broilers from each of the two Trial Houses (2 & 3) and each of the two Control Houses (1 & 4). Section 4.7 shows that the increase in income (because of a better quality of broiler produced) is of far more significance than merely looking at the increase in weight.**

| Farm | Control Houses | | Trail Houses | | Change % |
|---|---|---|---|---|---|
| | Total | Average Feed | Total | Average Feed | |
| MP BADENHORST | 2,755 | NOT MEASURED | 1,085 | NOT MEASURED | N/A |
| RAYNEL RANCH (2) | 44,010 | 3.751 | 22,240 | 3.654 | -2.59 |
| RAYNEL RANCH (3) | 44,010 | 3.751 | 23,572 | 3.401 | -9.33 |
| CLIFFORD ESTATE | 46 | NOT MEASURED | 47 | NOT MEASURED | N/A |

**At RAYNEL RANCH, the saving on feed was as follows:**

**House 2 : 22,240 x (3.751 – 3.654) = 2,158 kg @ R1,450.00 = R3,129.10**

**House 3 : 23,572 x (3.751 – 3,401) = 8,250 kg @ R1,450.00 = R11,962.50**

**These savings amounted to 16.56% and 63.29% of the cost of the Cell-Vet used in those houses (Assuming that 54**

litres of Cell-Vet @ R350.00 per litre = R18,900.00 was used in each house. See Section 7 on COST-EFFECTIVENESS).

Furthermore, to establish whether or not there was any significant difference in the feeds given to the broilers on the various sites, samplings of two feeds were tested by the Nutrition Laboratory Onderstepoort (University of Pretoria), and showed no significant differences. (See APPENDIX 8 : Feed Analysis).

4.5 FEED CONVERSION RATIO

Throughout, there was a decrease in Feed Conversion Ratio in the Trial Houses using Cell-Vet.

| Farm | Control Houses | | Trail Houses | | Change % |
|---|---|---|---|---|---|
| | Total | F.C.R. | Total | F.C.R. | |
| MP BADENHORST | 3,134 | NOT MEASURED | 1,566 | NOT MEASURED | N/A |
| RAYNEL RANCH (2) | 44,010 | 1.900 | 22,240 | 1.780 | -6.07 |
| RAYNEL RANCH (3) | 44,010 | 1.900 | 23,572 | 1.690 | -11.05 |
| CLIFFORD ESTATE | 46 | 1.762 | 47 | 1.520 | -13.73 |

4.6 PERFORMANCE EFFICIENCY FACTOR

Throughout, there was an increase in Performance Efficiency Factor in the Trial Houses using Cell-Vet. Based on previous factors, the PERFORMANCE EFFICIENCY FACTOR (P.E.F.) is calculated:

$$P.E.F. = \frac{\%\ SURVIVORS\ X\ AVERAGE\ WEIGHT\ X\ 100}{F.C.R.\ X\ AVERAGE\ AGE\ IN\ DAYS}$$

| Farm | Control Houses | | Trail Houses | | Change % |
|---|---|---|---|---|---|
| | Total | P.E.F. | Total | P.E.F. | |
| MP BADENHORST | 2,755 | NOT MEASURED | 1,085 | NOT MEASURED | N/A |
| RAYNEL RANCH (2) | 44,010 | 226.98 | 22,240 | 246.73 | +8.70 |
| RAYNEL RANCH (3) | 44,010 | 226.98 | 23,572 | 270.47 | +19.16 |
| CLIFFORD ESTATE | 46 | 212.12 | 47 | 324.23 | +52.85 |

4.7 INCOME FROM SALEABLE MASS OF BROILERS

This is the most important section, because it clearly shows that by using Cell-Vet, income from the saleable mass of the broilers increased above the actual cost of the product.

Only data from the four houses at RAYNEL RANCH will be analysed here, because the broilers from MP BADENHORST and CLIFFORD ESTATE were sold between 42 – 56 days to a variety of private individuals at varying prices; whereas the broilers from RAYNEL RANCH were sold at 42 days to a large wholesaler, who then supplied RAYNEL RANCH with accurate statistics. RAYNEL RANCH is a subcontractor for the large wholesaler, who supplies RAYNEL RANCH with all the day-old chicks; the feed; the vaccines, antibiotics, etc. Therefore, the amounts in this table exclude these cost factors and can be considered to be the gross profit the farmer made, from which he would have to pay operational and administration costs.

Because there was a difference in the income received for the saleable mass of the broilers from each of the four houses, the income of all four houses is reported here. For the Control Houses, a weighted average has been calculated in order to compare this with the Trial Houses that used Cell-Vet.

| Farm | Actual Kg | Actual Rand | Actual Rand/Kg | Average Rand/Kg | Trail Rand/ Kg | Change % |
|---|---|---|---|---|---|---|
| RAYNEL RANCH (1) | 44,300 | R34,736.00 | R0.784 | R0.680 | | |
| RAYNEL RANCH (2) | 44,937 | R47,030.00 | R1.047 | | R1.047 | +53.9 |
| RAYNEL RANCH (3) | 46,768 | R54,547.300 | R1.167 | | R1.167 | +71.6 |
| RAYNEL RANCH (4) | 41,087 | R23,719.00 | R0.577 | R0.680 | | |

The financial result is the most significant one to consider when evaluating the benefits of dispensing Cell-Vet to broilers. Results showed that the quality of the saleable mass increased dramatically in the two Trial Houses, bringing in a considerable amount more income and profit, for the farmer:

| Farm | SALEABLE | EXPECTED INCOME | Trail Houses | Change |
|---|---|---|---|---|

| | MASS (KG) | PRICE / KG | TOTAL INCOME | PRICE / KG | TOTAL INCOME | RAND | % |
|---|---|---|---|---|---|---|---|
| RAYNEL RANCH (2) | 44,937 | R0.680 | R30,557.00 | R1.047 | R47,303.00 | R16,473.00 | +53.9 |
| RAYNEL RANCH (3) | 46,768 | R0.680 | R31,802.00 | R1.167 | R54,547.00 | R22,745.00 | +71.6 |
| TOTAL | | | | | | R39,218.00 | |

**Without taking any of the savings into consideration, this increase in income alone of R39,218.00 is sufficient to pay for the 108 litres of Cell-Vet @ R350.00/litre (i.e. R37,800.00).**

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**5. VETERINARY ANALYSIS**

**In order to deepen the examination of the efficacy and safety of Cell-Vet (both from the points of view of the product being non-toxic to the birds, as well as the results being totally safe for human consumption), a veterinary perspective was included in this project.**

**5.1 MEDICAL PROGRAMME**

**Before discussing the findings of the post-mortems, it is important to note the vaccination programmes employed at MP BADENHORST and RAYNEL RANCH, and the fact that no vaccinations, antibiotics or growth stimulants were used at CLIFFORD ESTATE.**

**Furthermore, the drinking water of the Trial Houses at RAYNEL RANCH was not chlorinated; whereas the drinking water of the Control Houses was chlorinated. Both sources of water were drawn from the same borehole. Chlorination is a common practice to destroy any harmful micro-organisms in the water, unfortunately, it can also have detrimental effects on the digestive abilities of broilers, thus impeding weight gain. The water used at CLIFFORD ESTATE and MP BADENHORST was not chlorinated.**

**5.1.1 MP BADENHORST**

**The routine medical vaccination programme employed at MP BADENHORST was as follows: Newcastle at days 1, 12 & 21; and Gumboro at 16 days.**

**5.1.2 RAYNEL RANCH**

**The routine medical vaccination programme employed at RAYNEL RANCH was as follows:**

**1. At day 1 : Full dose Newcastle and half-dose IB vaccination with day-old chicks.**
**2. At days 2, 3 & 4 : Tylosine tartrale (Tylan) in drinking water.**
**3. At day 10 : ART vaccine.**
**4. At day 14 : IDB vaccine.**
**5. At day 16 : Newcastle vaccine.**
**6. Zinc Bacitracin feed supplementation for growth.**

**5.1.3 CLIFFORD ESTATE**

**At CLIFFORD ESTATE, no programme of vaccines, antibiotics and growth stimulants was employed. As can be observed from the previous Sections, the broilers suffered no detrimental effects from not receiving any vaccines, antibiotics or growth hormones. Dark Field Microscopy analysis also showed no detrimental effects (See Section 6).**

**5.2 RANDOM SAMPLES and POST-MORTEMS**

**Random samples of broilers were drawn from the Control and Trial Houses at RAYNEL RANCH at various intervals during the growth process (4, 12 & 35 days old), and post-mortems were conducted. Specimens of various organs were submitted for histopathological examination. Biopsies were taken of pectoral muscle tissue, lung, heart, duodenum, liver, Bursa of Fabricius, and spleen. Swabs were taken from the gut for bacterial culture; and gizzards were dissected for visual examination.**

**See APPENDIX 9 for pictures of post-mortems done by Dr Melvyn Greenberg at RAYNEL RANCH.**

**Unfortunately, because of the distance of MP BADENHORST and CLIFFORD ESTATE from Dr Greenberg's Veterinary Hospital, no post-mortems were conducted on these farms.**

**5.3 CONCLUSIONS FROM POST-MORTEMS**

**Post-mortems of random samples of broilers taken from both the Control and Trial Houses at 4 days old, 12 days old, and 35 days old, and compared to each other, revealed the following:**

**5.3.1 Macroscopically, the evidence of Cell-Vet being used cannot be detected.**

**5.3.2 Microscopically, the influence of Cell-Vet being used cannot be identified.**

**5.3.3 Broilers on Cell-Vet attained increased broiler weights and improved quality, in spite of the whole flock from day-old stage until slaughter stage being intestinally positive for Escherichia coli. Traces of Klebsiella pneumoniae, Pseudomonas aeruginosa, and Proteus mirabilis were also isolated from certain individuals, without any detrimental effects.**

**5.3.4 Mortalities increased soon after vaccinations; however, mortalities were decreased in the Trial Houses using Cell-Vet.**

**5.3.5 Broilers in Trial House 2 (using Cell-Vet) survived normally fatal septicaemic conditions, and were still fit for human consumption.**

**5.3.6 Gizzards of broilers from the Trial Houses (using Cell-Vet) showed no signs of erosion or ulceration, whereas gizzards of broilers from the Control Houses showed serious signs of erosion and ulceration (as early as 12 days old), which influences the weight gain of the broiler. According to the farmer, the cause of the erosion and ulceration was probably due to the acidic content of the feed; however, in both the Trial Houses, the Cell-Vet appeared to neutralise this negative effect, resulting in increased weight and improved quality with these broilers. (See APPENDIX 10 for pictures of examined gizzards).**

**5.3.7 Examination of the contents of the gizzards also revealed that the broilers using Cell-Vet had a proper texture and lighter colour in their gizzard content; compared with broilers from the Control Houses that had larger particles and darker patches in the gizzard content. (See APPENDIX 10 for pictures of examined gizzards).**

**In conclusion, histopathological tests showed that the broilers using Cell-Vet were perfectly safe for human consumption; and, in fact, yielded a better quality of broiler than those not using the product.**

**See APPENDIX 11 : Summary of Veterinary Reports.**

**See APPENDIX 12 : Sample of report from BothaVanderLugt Veterinary Pathologists.**

**5.4 GENERAL OBSERVATIONS AND CONCLUSIONS**

**Some general observations and conclusions are as follows:**

**5.4.1 The true effects of Cell-Vet will be influenced by:**

**1) genetic potential of the birds;**
**2) usage of the product in all stages from laying hens through day-old chicks until slaughter stage;**
**3) hygiene conditions;**
**4) other supplementations in the water; and**
**5) quality of water and feed.**

**5.4.2 The basic intention of using Cell-Vet is to:**

**1) reduce feed costs;**
**2) reduce mortalities;**
**3) improve feed conversion ratio;**
**4) accelerate arrival of slaughter weight; resulting in increased number of cycles p.a.;**
**5) limit or eliminate need for vaccinations;**
**6) limit or eliminate need for antibiotics;**
**7) limit or eliminate need for growth stimulants;**
**8) produce better quality of broiler for human consumption.**

**(As was shown in the trial at CLIFFORD ESTATE, all eight of the above were achieved there).**

**5.4.3 Cell-Vet must be supplemented at all times throughout the growth process, at varying concentrations depending on fixed and situational needs; e.g.**

**for the first 7 days, only a low concentration (1:4,000) should be dispensed to the new chicks in order to allow for nature to take its course, so that genetically weak birds and those that are of extreme poor quality can easily be identified and culled; and the present concentration should immediately be doubled or trebled as soon as the birds are challenged by some bacterial/viral infection.**

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**6. BLOOD TESTS : DARK FIELD MICROSCOPY**

**In order to make this project as comprehensive as possible, several blood samples were analysed using dark field microscopy. For this part of the test, the services of Dr Priscilla Rowan were employed. (See APPENDIX 13 : Blood Analysis : Dark Field Microscopy.**

**6.1 SAMPLES AND ANALYSIS**

**With dark field microscopy, blood samples have to be analysed within minutes after being drawn. Because of this, 10 x 38-day-old broilers from CLIFFORD ESTATE were chosen for analysis. They were chosen because none of the broilers had received any vaccines or antibiotics. Five of broilers from the Trial House where they had been taking Cell-Vet since day-old stage, and five broilers from the Control House (no Cell-Vet), were chosen at random.**

**Dr Melvyn Greenberg drew samples of blood from the live broilers, and Dr Priscilla Rowan immediately analysed the blood samples.**

**See APPENDIX 13 for pictures of Dr Priscilla Rowan, Dr Melvyn Greenberg, and the equipment used.**

**6.2 CONCLUSIONS FROM BLOOD ANALYSIS**

**The samples of blood drawn from broilers from the Control House, showed clear signs of colloid symplasts, which is a pathological condition in blood; as well as signs of endobiosis, which is the end product of a degenerative process. Linked to the symplasts, were traces of fibrin, which can impede the flow of blood. There was also an obvious lack of oxygenation and mineralisation of the cells.**

**The samples of blood drawn from broilers from the Trial House, showed very few symplasts, and had excellent oxygenation, mineral content, and demonstrated more mobility than the samples from the Control House. The blood plasma showed clearly the presence of beneficial elements such as somatids and lymphocytes. Lymphocytes are involved in the broiler's immunity, and can differentiate into helper, killer, or suppressor cells in the immune system as required.**

**See APPENDIX 14 : Pictures of Blood Samples.**

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**7. COST-EFFECTIVENESS OF Cell-Vet**

**Not only were there ecological benefits in using Cell-Vet for broilers, but there were also significant cost-effective benefits.**

**At RAYNEL RANCH, the cost-effectiveness of Cell-Vet was as follows:**

| Factor | Reference | Trial House 2 | Trial House 3 | Total |
|---|---|---|---|---|
| Saving in Mortalities | Section 4.2 | R270.25 | R1,802.05 | R2,072.30 |
| Saving in Feed | Section 4.4 | R3,129.10 | R11,962.50 | R15,091.60 |
| Increased Saleable Mass | Section 4.7 | R19,872.35 | R36,509.55 | R56,381.90 |
| Total Savings + Income | | R19,872.35 | R36,509.55 | R56,381.00 |
| Cost of Cell-Vet | | R18,900.00 | R18,900.00 | R37,800.00 |
| Additional Profit | | R972.35 | R17,609.55< | R18,581.00< |

**The above table shows that not only did the broilers in House 2 survive normally fatal septicaemic conditions, and were still fit for human consumption (refer to Section 5.3.3), the house made an overall profit of R972.35. It must also be born in mind that House 2 was historically the worst producing house at RAYNEL RANCH, and became the second best producing house, using Cell-Vet.**

**The above table shows that House 3, an historically average producing house, became the best producing house, using Cell-Vet, and made an overall profit of R17,609.55.**

**At RAYNEL RANCH, the cost-effectiveness of Cell-Vet can be summarised as follows (the numbers of saleable broilers at the end of the cycle have been used in the following calculations, to obtain a "worst-case scenario" regarding cost per Broiler):**

| Details | Trial House 2 | Trial House 3 | Average |
|---|---|---|---|
| Cost of Cell-Vet Per Broiler | R0.85 | R0.80 | R0.83 |
| Additional Income Per Broiler | R3,129.10R0.89 | R1.55 | R1.22 |
| Additional Profit | R0.04 | R0.75 | R0.39 |

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**8. COMMENTS FROM USERS OF Cell-Vet**

**After the trials, all three users of Cell-Vet said that they were impressed by the results achieved, and would use the product during future broiler cycles.**

**When interviewed by Jan Harm Greyling, Mr David Foster, Manager of RAYNEL RANCH, said:**

**"The key to obtaining the most benefit from dispensing Cell-Vet into the drinking water of broilers is to vary the concentrations of the product used, depending on the various situations."**

**"For example, during the first seven days, a low concentration such as 1:4,000 should be dispensed to the chicks, to allow nature to take its course. The chicks with genetic weaknesses and those that are of extreme poor quality would then fall behind and out of the system at an early age, thereby eliminating unnecessary cost of feed. Trials in the past have proved that antibiotics, which only suppress the problem, have not helped these young birds because of the bacteria counts being so high in the first place. They die anyway. Therefore, using a high concentration of Cell-Vet initially is not advisable.**

**The nipple drinkers proved to be more cost-effective dispensers of Cell-Vet. There is less wastage and contamination or deterioration of the product.**

**It is important to monitor the feed conversion ratio constantly to assess what concentration of Cell-Vet to use."**

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**9. CONCLUSIONS**

**The three trials on three different farms proved that Cell-Vet is a beneficial product to be dispensed on a continuous basis into the drinking water of broilers. It proved to be beneficial both from an ecological and cost-effectiveness point of view, resulting**

**9.2 From a cost-effectiveness point of view, the trials have shown that Cell-Vet is a cost-effective product, costing on average R0.83 per broiler, and yielding savings and additional income from saleable broilers of R1.22; resulting in an additional profit of R0.39 per broiler. These figures are calculated on the experience at RAYNEL RANCH; taking into consideration that the broilers from Trial House 2 were in historically the worst producing house (also using bell-drinkers), and survived normally fatal septicaemic conditions. If all the four houses at RAYNEL RANCH had nipple drinkers, and performed as House 3 performed, the average cost per broiler would have been R0.80; and the additional savings plus income would have been R1.55 per broiler; resulting in an additional profit of R0.75 per broiler.**

**The cost of installing nipple drinkers in a house that can accommodate 25,000 broilers, would cost about R60,000.00. Therefore, at an additional profit of R0.75 per broiler, the entire system would be paid for after about three cycles, which makes this a very feasible option.**

**9.3 From histopathological analyses, Cell-Vet proved to be totally safe to dispense to broilers, leaving no residues or any harmful side-effects. Macroscopically and microscopically, broilers that had been continuously using Cell-Vet were totally safe for human consumption.**

**9.4 Histopathological analysis also showed that the broilers using Cell-Vet in Trial House 2 at the RAYNEL RANCH survived normally fatal septicaemic conditions, and were still fit for human consumption. Furthermore, this Trial House delivered an additional profit of R972.35 (R0.04 per broiler); and even outperformed the two Control Houses, that did not use Cell-Vet, and did not have any septicaemic conditions.**

**9.5 Dark field microscopy revealed that blood samples of broilers that had continuously been using Cell-Vet had more oxygenation and mobility than blood samples of broilers that had not received any Cell-Vet. Furthermore, the former had only small traces of colloid symplasts (pathological condition) and showed no signs of endobiosis (degenerative condition); when compared with the latter that evidenced many colloid symplasts and endobiosis.**

**9.6 Of great significance is the trial conducted at CLIFFORD ESTATE were 100 chickens were reared with no vaccines, antibiotics and growth stimulants. Broilers in the Control House survived 56 days with only 8.0% mortalities, compared with 11.27% in the Control Houses of RAYNEL RANCH. The best Feed Conversion Ratio (Section 4.5), and Performance Efficiency Factor (Section 4.6) came from the broilers in the Trial House on CLIFFORD ESTATE.**

**9.7 The fact that the broilers in Trial House 2 at RAYNEL RANCH also survived a normally fatal septicaemic condition, and were not only still fit for human consumption, but yielded a higher income than broilers from both Control Houses 1 & 4, indicates that when Cell-Vet is dispensed into the drinking water of broilers in a continuous manner, it**

**proves to be a most beneficial and cost-effective product.**

**9.8 Not reported in any other part of this report was the experience of Mr David Foster at RAYNEL RANCH who decided to give the broilers in one of the Control Houses three litres of Cell-Vet in 3,000 litres of water just before the catching period started. He reported that mortalities during catching and after catching were remarkably reduced compared to that of the other houses that had not had any exposure to Cell-Vet. He also reported a reduction in "down-grades" due to a reduction of back-scratching, which is usually a major problem during a stressful catching process.**

**Even in this simple application, Cell-Vet proved to be cost-effective.**

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**10. CLOSING COMMENTS**

**More research will be conducted in the important area of limiting or reducing vaccines, antibiotics and growth stimulants in the rearing of broilers; and replacing this with a unique product such as Cell-Vet, which works at constantly oxygenating the entire system of the bird, and naturally building up its immune and metabolic systems to optimal levels. In this way, the bird itself is more capable of successfully dealing with bacterial, fungal, viral and parasitic infections and infestations. The oxygen and minerals in Cell-Vet are utilized for building healthier cells and structure in the bird; and facilitating more effective digestion, resulting in improved feed conversion ratios.**

**Today, a crisis situation is arising, with**

**Increasing costs and growing nutritional deficiencies in many feeds;**

**increasing water and environmental pollution impacting on food production;**

**diminishing efficacy of vaccines, antibiotics and growth stimulants; and growing governmental and consumer awareness about eating natural and healthy food.**

**An example demonstrating how this crisis situation is of growing concern, is APPENDIX 15 , which provides some information about two fluoroquinolones antibiotics (Baytril and SaraFlox) that the Food and Drug Administration in America planned to ban in the poultry industry, because of the possible effect of boosting the transmission of resistant microbes from animals to people. These antibiotics are used to treat respiratory problems in chickens and turkeys. The article states: "Without the drugs, farmers would be forced to find other ways to protect their flocks from illness".**

**Because of this untenable situation, Cell-Vet, which is a leading-edge super-energized nutritional product, is the solution to many problems; and, as a daily supplement for broilers, will deliver a cost-effective, ecological and sustainable end-result to farmers in the poultry industry.**

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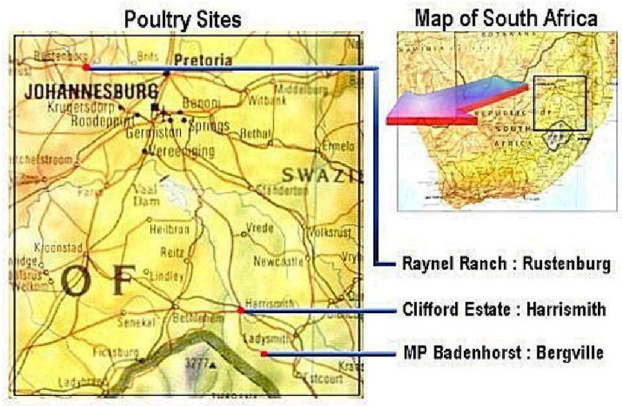
**APPENDIX 1**

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**APPENDIX 2**

Jan Harm Greyling at MP Badenhorst Broiler Farm. House was divided into two sections for Trial and Control Groups.

Water Storage Header Tank used for dispensing water + Cell-Vet.

Chickens in Trial section of the house. Bell-drinkers used throughout house for Control and Trial groups.

Jan Harm with Solomon and Nathi

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**APPENDIX 3**

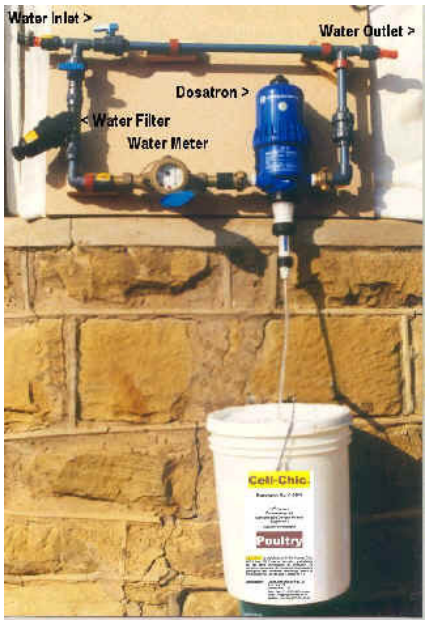
House 3 with Nipple-Drinkers

House 1 Water Storgae Header Tank

House 4 Coal-fired Heating System

House 2 with Bell-Drinkers

House 3 with Nipple-Drinkers




**Dosatron Dispensing System**

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**APPENDIX 4**

**APPENDIX 5**

**INPUTS: CC Ratio / S.P. of Cell-Vet / No of Birds / Water Total**

**CC Ration 1 : 4,000**

**S.P. of Cell-Vet = R350.00 per Litre**

Click here to view info

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**APPENDIX 6**

| Laboratory No. | | B/H WL 1015/2001 | B/H WL1016/2001 | Maximum Allowable Limit SABS 241< | Method Reference |
|---|---|---|---|---|---|
| pH< | | 6,9< | 7,7< | 5,5-9,5< | 7< |
| Saving in FeedConductivity m< | mS/ | 36< | 51< | 300< | 9 |
| Nitrate as N | mg/l< | 12,2< | <0,50< | 10 | - |
| Chloride as Cl | mg/l< | 28 | 8.0 | 200 | - |
| Sulphate as S04 | mg/l< | 13 | 36 | 200 | - |
| Flouride as F | mg/l< | 0.42 | 0.82 | 1.0 | - |
| Total Hardness as CaC03< | | 100 | 270 | 650 | - |
| Faecal Coliform | /100ml< | 0 | 0< | Nil< | 12< |

| | | | | | |
|---|---|---|---|---|---|
| Coliform | /100ml< | 3< | 22< | Nil< | 13< |
| Cadmium as Cd | mg/l< | <0,01< | <0,01< | 0,02< | -< |
| Calcium as Ca | mg/l< | 17< | 71< | 150< | -< |
| Iron as Fe | mg/l< | 0,14< | 0,01< | 2,0< | -< |
| Lead as Pb | mg/l< | <0,03< | <0,03< | 0,1< | -< |
| Magnesium as Mg | mg/l< | 14< | 22< | 70< | -< |
| Potassium as K | mg/l< | 2,3< | 2,1< | 100< | -< |
| Sodium as Na | mg/l< | 32< | 18< | 400< | -< |

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**APPENDIX 7**

**Cell-Vet pH TESTS**

**Cell-Vet : pH 0.5 ; Temp. 14° C.**

**At varying dilutions of Cell-Vet mixed with water, the following results were tabulated:**

| Cell-Vet : Water | pH |
|---|---|
| 1 : 1 | 0.5 |
| 1 : 100 | 2.0 |
| 1 : 250 | 2.5 |
| 1 : 500 | 3.5 |
| 1 : 1,000 | 4.5 |
| 1 : 2,000 | 6.3 |
| 1 : 3,000 | 6.6 |
| 1 : 4,000 | 6.6 |

**Several tests at each ration yielded identical results.**

**At a ratio of 1:2,000, the drop in pH of the water is very slight (<5.0>; and, at this pH 6.3, the dilution would have no short to long-term adverse effect on metals.**

**At a ratio of 1:3,000, there is no detectable change in the pH of the water.**

**It can therefore be concluded that when Cell-Vet is mixed with water at rations of 1:2,000 and greater, there will be no short to long-term adverse effects on metals.**

**Since Cell-Vet is usually used in ratios ranging from 1:2,000 to 1:4,000; it is concluded that it will have no short to long-term adverse effect on metals.**

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**APPENDIX 8**

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**APPENDIX 9**

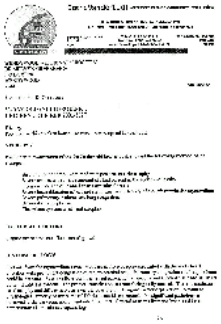
**Dr. Melvin Greenberg B.V. Sc. Conducting post-mortems on various broilers for histopathological analysis.**

**APPENDIX 11**

Click here to view VETERINARY ANALYSIS – SUMMARY OF VETERINARY REPORTS

**APPENDIX 12**

**Click on the image to enlarge.**



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**APPENDIX 13**

**Dr. Priscilla Rowan M.M.M.Ch. (Rand) D.A. (S.A.) Dip. International Bio-oxidative Medicine**

**Dark Field Microscope : 4,000 x magnification**

**Dr. Melvin Greenburg drawing blood sample for analysis**

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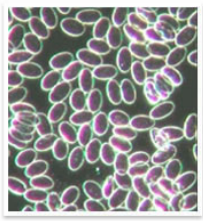
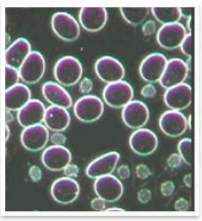
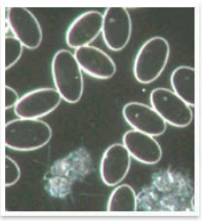
**APPENDIX 14**



**Healthy Blood Sample of Broiler from Trial House - on Cell-Vet. Excellent oxygenation (white iridescence around each cell) and mineralisation (hue of colours inside each cell). Plasma is clear with presence of beneficial somatids and lymphocytes.**



**Healthy Blood Sample of Broiler from Trial House - on Cell-Vet. Presence of many lymphocytes, which are involved in the Broiler's immunity, and can differentiate into helper, killer, or suppressor cells in the immune system.**



**Unhealthy Blood Sample of Broiler from Control House - not on Cell-Vet. Poor oxygenation, and very poor mineralisation of cells (even when sample is enlarged. Presence of fibrin and symplasts (pathological conditions), as well endobiosis (degenerative condition).**

**——————————————————————————————**

**APPENDIX 15**

**FDA to Ban Two Poultry Antibiotics By Marc Kaufman : Washington Post Staff Writer**

**The Food and Drug Administration announced plans yesterday to ban the use of two antibiotics used by poultry farmers to keep chickens and turkeys healthy, saying the practice increases the danger that humans will become infected with germs that resist treatment.**

**The removal would mark the first time the government has pulled any drug to combat infections that have grown resistant to antibiotics, a rising problem that public health officials have been warning for years could return the world to the days before penicillin and other infection-killers.**

**The action would also be the first specifically aimed at reducing the use of any specific antibiotics by livestock farmers, a practice that has increasingly raised alarms that it may boost the transmission of resistant microbes from animals to people.**

**Public health organizations, including the federal Centers for Disease Control and Prevention and the World Health Organization, have strongly advocated such a ban for years. But agriculture and pharmaceutical interests have successfully held them off until now.**

**Abbott Laboratories of North Chicago, Ill., maker of one of the drugs, will withdraw its antibiotic immediately, according to the FDA. But Bayer Corp. Animal Division, of Shawnee Mission, Kan., which dominates the market, said it will consider whether to request a hearing to contest the proposed ban.**

**"We want to take a look at the basis of the [FDA's] decision," said Senior Vice President John Payne. "We have always said if we thought our product is causing harm, we would do the right thing."**

**The antibiotics in question are in the class known as fluoroquinolones, which have been available for human use since 1986 and are commonly prescribed to treat serious gastrointestinal illness, including from the common campylobacter bacteria. The FDA action would not affect the availability of the drugs for humans.**

**The drugs were approved for chickens, turkeys and cattle in the mid-1990s, and since then the incidence of resistance to fluoroquinolones in people has increased dramatically. After years of testing and construction of an elaborate risk assessment, the FDA concluded earlier this year that the health of at least 5,000 Americans is affected each year by the use of these drugs in chickens.**

**These people eat animals that are carrying resistant campylobacter bacteria because the animals were treated with fluoroquinolones. If the bacteria make people sick and they seek treatment, fluoroquinolones will be far less effective than normal. This could be life-threatening to the elderly, to children and to people with depressed immune systems.**

**While the consequences of fluoroquinolone resistance may not be grave to most people, public health officials call it the tip of an iceberg of rising resistance to dozens of other life-saving antibiotics. Resistance develops when antibiotics are overused, both by doctors treating people and by farmers treating animals. An estimated 40 percent of the nation's antibiotic use is in livestock.**

**The FDA selected fluoroquinolones to study because they are so commonly used and because the agency was able to**

collect the necessary data to directly link the drugs' use in chickens with a specific problem in people.

The drugs, Baytril from Bayer and SaraFlox from Abbott, are used to treat respiratory problems in chickens and turkeys. Because the birds are raised in large flocks, it is impossible to treat the birds individually, and so the drugs are used in the flocks' drinking water. About 1.5 percent of chickens are treated with the antibiotics, according to industry sources. Without the drugs, farmers would be forced to find other ways to protect their flocks from illness.

The FDA is reviewing the use of fluoroquinolones in cattle as part of a comprehensive examination of all agricultural antibiotic use.

If Bayer challenges the ban for poultry, either in court or through an administrative appeal, it could take months for the issue to be resolved.

Reflecting the worries of Bayer and the animal pharmaceutical industry, several members of Congress wrote to Health and Human Services Secretary Donna E. Shalala on Wednesday, voicing concern about the FDA's impending action.

"The FDA's decision regarding fluoroquinolone use will set a precedent for all future activity regarding antibiotic resistance and will have a significant impact on the livelihood of hard-working poultry growers and on food safety," wrote Rep. Calvin M. Dooley (D-Calif.). "Given these implications, FDA must make the process more transparent and must render a decision based on fact rather than fear."

But advocates of a more restrained use of antibiotics hailed yesterday's action.

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