

Hemicell is a proprietary and unique enzyme feed additive for poultry diets manufactured by ChemGen Corp. Soybean meal contains b-mannan, an anti-nutritive fiber which causes an innate immune response and inhibits live performance in broilers. This fiber is degraded and eliminated by Hemicell. Hemicell is produced by fermentation of *Bacillus lentus* and includes low levels of other enzymes, such as amylase, xylanase, cellulases, and alpha galactosidase.

## MECHANISM OF ACTION

As a source of b-mannanase, Hemicell degrades the b-mannan fibers found in vegetable feed ingredients, especially soybean meal and sunflower meal. The elimination of this fiber provides at least seven commercial benefits.

1. More efficient feed utilization
2. Improvements in body weight uniformity
3. Reduced mortality
4. Less feces is produced and contains less moisture
5. Dryer litter
6. Reduced dependency on medications
7. Increased breast meat yield

**The magnitude of these improvements in performance may be enhanced when broilers are presented with a disease challenge.**



## CONFIRMATION OF HEMICELL'S BENEFITS

Several broiler pen trials have confirmed the broiler matrix values. In one such pen trial (see below) broilers were grown to 42 days of age. The trial comprised three treatments; a positive control, a negative control (positive control less 120 kcal/kg), and a negative control with Hemicell included. A summary of the results of this trial are provided below.

### Impact of Hemicell when formulated into a typical broiler diet

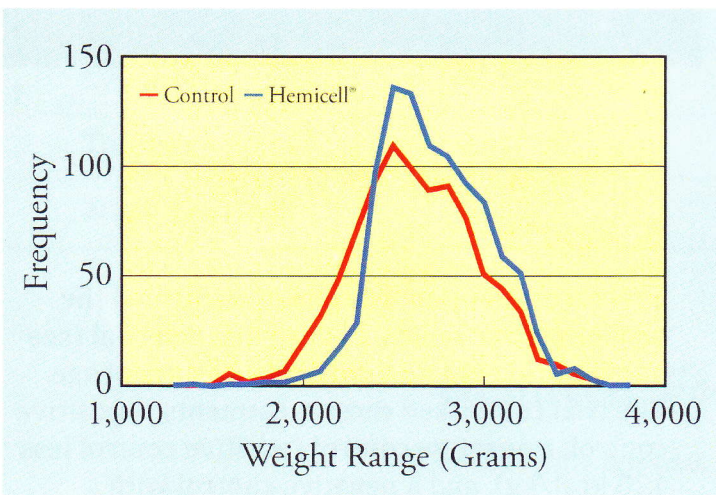
Treatment		Mortality (%)	Individual Body weight uniformity (CV) <sup>1</sup>	Average live weight (kg)	Feed Conversion
1	Positive Control	2.9 % <sup>a</sup>	11.7 % <sup>b</sup>	2.396 <sup>a</sup>	1.827 <sup>b</sup>
2	Negative Control (NC)	3.4 % <sup>a</sup>	14.1 % <sup>a</sup>	2.351 <sup>a</sup>	1.894 <sup>a</sup>
3	NC plus Hemicell	4.6 % <sup>a</sup>	9.7 % <sup>c</sup>	2.433 <sup>a</sup>	1.826 <sup>b</sup>

**Note 1:** All birds in each pen were individually weighed to derive a coefficient of variation for every pen. The average of the pen CVs for each treatment are presented in this column.



## HEMICELL'S IMPACT ON THE UNIFORMITY OF LIVE-WEIGHTS

In more than 100 pen trials with Hemicell, we have observed improved feed conversions and average body weights. Recently, the uniformity of weights in broilers utilizing Hemicell compared to controls has been examined. In each of the cases observed, the live weight uniformity (as measured by the coefficient of variation) of broilers grown on feeds containing Hemicell were better than those grown on control feeds. These improvements in uniformity were substantial, ranging from 13% to 26%.



## EFFECT OF HEMICELL ON MORTALITY & REDUCED DEPENDENCE ON MEDICATIONS

In an experiment conducted where broilers were challenged with coccidial and clostridia pathogen the results demonstrate that under disease challenge conditions the presence of the b-mannan fiber is especially harmful.



The below research trial was conducted under severe disease stress in order to accentuate the impact of Hemicell on mortality. The positive benefit of Hemicell on mortality is also demonstrated in field trials that have been conducted. In 7 of 8 such field trials, mortality was improved, yielding an average improvement of 0.68% under commercial growing conditions.

Infection <sup>1</sup>	Treatment		Weight Gain 8-21 days (g)	F/G <sup>3</sup> 8-21 days	Mortality 8-21days (%)
	Medication <sup>2</sup>	Hemicell			
Yes	258.1 <sup>b</sup>	2.448 <sup>a</sup>	42.71 <sup>a</sup>	2.448 <sup>a</sup>	42.71 <sup>a</sup>
Yes	324.4 <sup>a</sup>	2.063 <sup>b</sup>	20.83 <sup>b</sup>	2.063 <sup>b</sup>	20.83 <sup>b</sup>
Yes	345.6 <sup>a</sup>	1.866 <sup>b</sup>	5.21 <sup>b</sup>	1.866 <sup>b</sup>	5.21 <sup>b</sup>

Notes: <sup>1</sup>Birds challenged at 8 d of age with 75,000 *E. acervulina* and 5,000 *E. maxima* oocysts per bird and at 11, 12, and 13 days with 10<sup>8</sup> cfu *C. perfringens*, all by oral gavage.

<sup>2</sup> BMD (bacitracin methylene disalicylate), 50 g/ton and Sacox (salinomycin), 60g/ton. <sup>3</sup> Mortality adjusted Feed/Gain ratio.



## HEMICELL'S IMPACT IN THE FIELD

Summary of Results of Field Tests with Hemicell in Broilers

Field Test	Number of Birds	Number of Farms	Improvement in Live Performance			
			Final Body Weight (g)	Feed Conversion	Weight-adj. Feed Conversion <sup>2</sup>	Livability (%-units)
1	480,000	10	34	0.031	0.043	0.37 %
2	5,100,000	126	7	0.040	0.043	0.85 %
3	20,000,000	550	79	0.029	0.058	0.31 %
4	14,000,000	360	62	0.060	0.083	0.26 %
5	1,400,000	75	39	0.061	0.075	2.33 %
6	2,000,000	79	36	0.018	0.031	0.00 %
7	5,520,000	184	29	0.032	0.043	0.20 %
8 <sup>1</sup>	10,000,000	252	-23	0.030	0.022	1.11 %
Average Results:			33	0.038	0.050	0.68 %

Notes: <sup>1</sup> In field trial #8, the birds on Hemicell feeds were 0.28 days younger than the birds grown on control feeds.

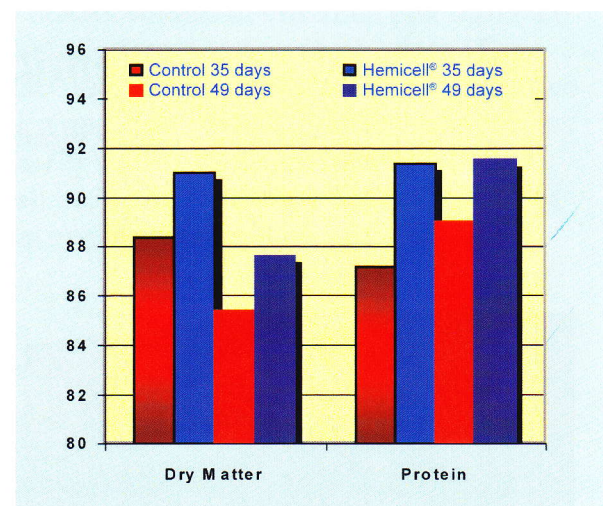
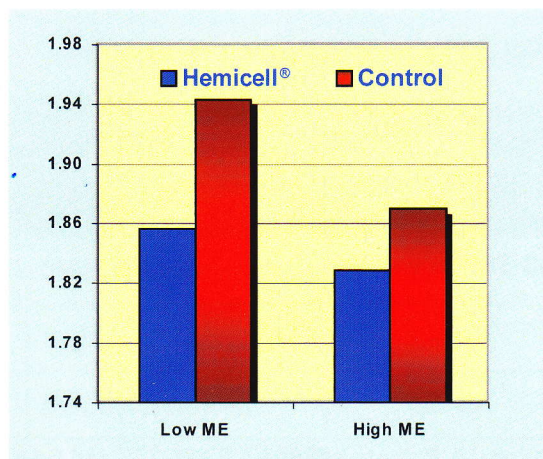
<sup>2</sup> 27 gram of weight difference = 0.01 of Feed Conversion (1 point)

## FORMULATING HEMICELL IN POULTRY DIETS

Hemicell significantly improves nutrient utilization:

- Energy by 80-150 kcal/kg feed
- Protein digestibility by 2-2.5%
- Fiber digestibility by 5-10%

Trial results support the benefits!!!



Effect of Hemicell on apparent digestibility in broilers at two ages Improvement: 2.2% to 2.6% in dry matter ( $p < 0.05$ ), and 2.5% to 4.2% in protein

Effect of Hemicell on 0-45 day weight-adjusted feed conversion in broilers. High ME=Low ME+143 Kcal/kg.



## Recommended Matrix Values for Hemicell-HT and Hemicell Liquid

Nutrient	Increase in Complete Diet	Hemicell-MP (200 g/MT; 0.02 %)	Hemicell Liquid (110 ml/MT; 0.0136 %)
ME (Kcal/Kg)	120	600,000	882,353
ME (MJ/kg)	0.5	2,500	3,676
Methionine (%)	0.00604	30.20	44.41
Cystine (%)	0.00432	21.60	31.77
Met+Cys (%)	0.01051	52.55	77.28
Lysine (%)	0.01530	76.50	112.50
Threonine (%)	0.01724	86.20	126.76
Tryptophan (%)	0.00227	11.35	16.69

## Hemicell® Feed Enzyme

*More meat...less cost...the Natural Way!*



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