

THE MOST COMPREHENSIVE, INDUSTRIAL SCALE ENZYME TRIAL EVER !

ALKACEL 20 X ws TRIAL, INTEGRATOR BROILER, DEC 2015

CONTROLLED TEMPERATURE (COOL CELL), AUTOMATED, 37,000 BIRDS X 2 BLDGS

COMPREHENSIVE FEED PROTEIN AND FIBER, MANURE PROTEIN AND FIBER, NITROGEN INTAKE AND EXCRETION PROFILE, FIBER INTAKE AND EXCRETION PROFILE AND GROWTH AND LIVEABILITY PERFORMANCE

ALKACEL 20X ws TREATMENT REGIMEN

Dose: 5gms/10lt of drinking water

Delivery mode: via DOSATRON to automatic waterer system

Frequency: continuous, 24/7, day 1 to harvest

Feed and Manure Assay Lab: LQCC

DATA GATHERED

Feed:

Total Feed Intake

CP

Total Protein Intake

NDF , ADF, Total Fiber Intake

Manure:

Total manure excretion,

Manure CP, Total Kjeldahl N and

Kjeldahl N without acid (Urinary N)

Total Protein excretion, Total N excretion, Total Urinary origin N, Total Proteinaceous origin N

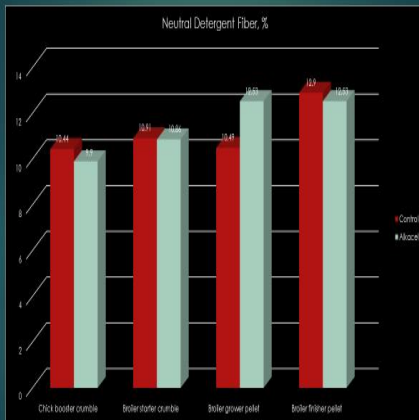
Total NDF in manure, Total Fiber excretion

Productivity:

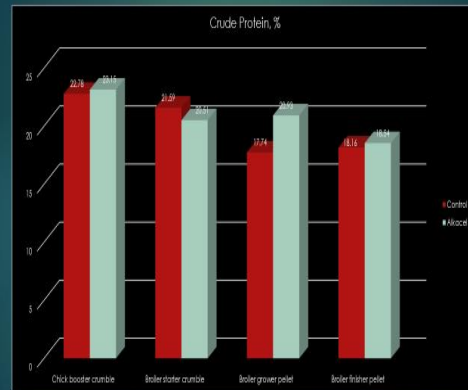
Total harvest weight, Days to harvest, ADG, FCR, Mortality, Costs

TRIAL Layout												
Group	Feed Stage	No. of Replicate per Feed Stage	No. of Chickens per Replicate	No. of Trials per Replicate	Dosage in Water	Length of Administration	Day of Manure Collection	Data to be Collected from Manure	Day of Feed Collection	Data to be Collected from Feeds	Other data to be collected	
Control	4	4	9,250	2	None	none	Day 4 Day 14 Day 22 Day 28	Crude Protein NDF, Total Nitrogen, Nitrogen without acid	Day 4 Day 14 Day 22 Day 28	CP, NDF,	ADG, FCR, Mortality, Feed Intake, Manure Volume	
Treatment	4	4	9,250	2	1 tsp per 10 ltrs	24hr Day 1 to Harvest	Day 4 Day 14 Day 22 Day 28	Crude Protein NDF, Total Nitrogen, Nitrogen without acid	Day 4 Day 14 Day 22 Day 28	CP, NDF,	ADG, FCR, Mortality, Feed Intake, Manure Volume	

Neutral Detergent Fiber in Different Feeds



Crude Protein in Different Feeds

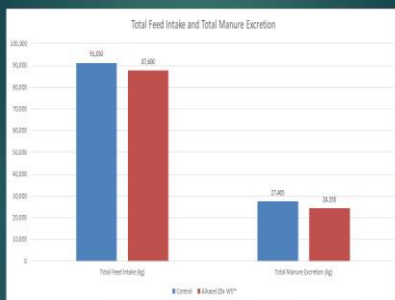


Comparative Total Feed Intake, Total Manure Excretion and Percent Excretion

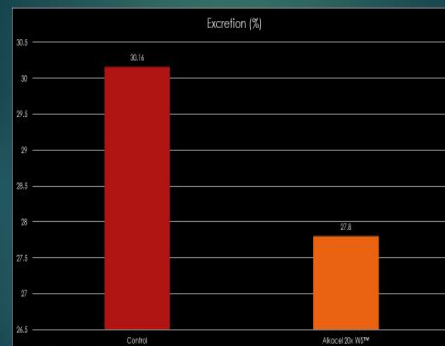
Group	Total Feed Intake (kg)	Total Manure Excretion (kg)	Excretion (%)
Control	91,050	27,465	30.16
Alkacel 20x WS™	87,600	24,350	27.80
Difference	3,450	3,115	2.36
% Difference	-3.79%	-11.35%	-7.82%

ALKACEL 20X WITH 3.79% LOWER FEED INTAKE AND 11.35% LOWER MANURE VOLUME

Total Feed Intake and Total Manure Excretion



Excretion Percentage



N ASSAY OF MANURE

	CHICK CRUMBLE	STARTER CRUMBLE	GROWER	FINISHER	AVE.
TOTAL KJELDAHL N %					
CONTROL	3.84	3.34	3.35	3.22	3.43
ALKACEL	3.44	3.46	3.27	3.63	3.45
TOTAL KJELDAHL W/O ACID N %					
CONTROL	1.14	0.12	1.08	0.65	0.75
ALKACEL	1.37	0.19	1.83	0.79	1.04

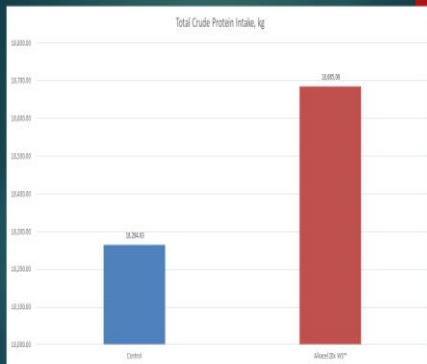
Kjeldahl N = total N present in Manure. N X 6.25 = CP or Total Protein
 Kjeldahl w/o acid N = total "free" or unbound N, representing urinary origin
 Kjeldahl N – Kjeldahl w/o acid N = Bound N or Proteinaceous Origin N

Comparative Protein Intake, Protein Excretion and Nitrogen Excretion

Group	Total Feed Intake, kg	Average Crude Protein in Feeds, %	Total Crude Protein Intake, kg	Total Manure Excretion kg	Average Crude Protein in Manure, %	Total Protein Excretion In Manure kg	Total Protein Excretion In Manure %	Total Nitrogen Excretion, kg
Control	91,050	20.06	18,264	27,465	21.46	5,893.99	32.27	943.04
Alkacel 20x WSTM	87,600	21.33	18,685	24,350	21.52	5,240.12	28.04	838.42
					Difference	-653.87	-4.23	-104.62
					% Difference	-11.09	-13.11	-11.09

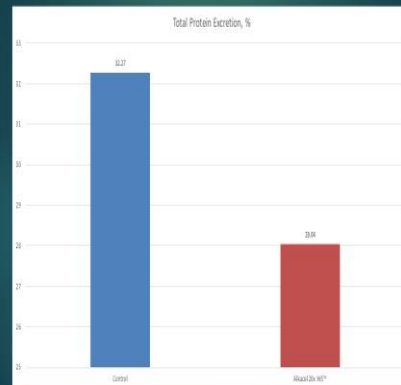
ALKACEL 20X WITH 13.11% LOWER PROTEIN EXCRETION IN MANURE

Total Crude Protein Intake



In Figure 3a, graph shows the total crude protein intake of both treatment groups. Alkacel 20x WSTM has a larger protein intake of 18,685.08 kg which is 420.45 kg (2.25%) greater than the control.

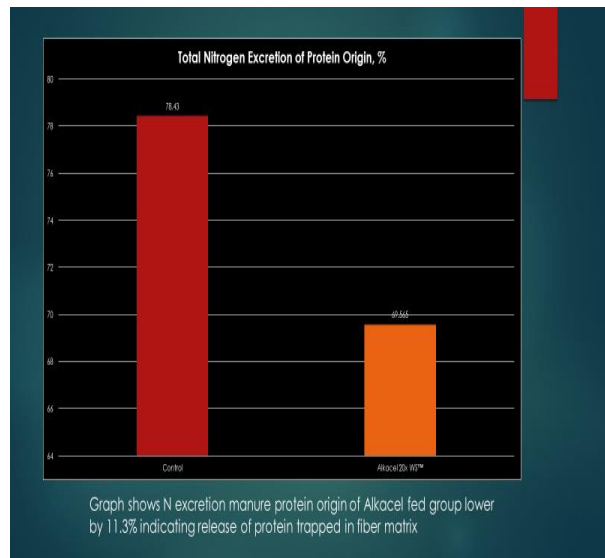
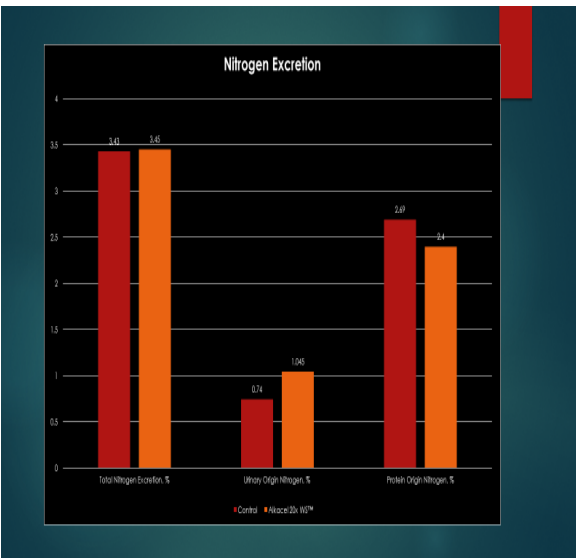
Total Protein Excretion Percentage



Comparative Nitrogen Excretion, Urinary and Protein Nitrogen, And Total Nitrogen Excretion from Protein Origin

Group	Average Nitrogen Excretion, % (Ave. Kjeldahl Nitrogen in Manure)	Average Urinary Origin Nitrogen, % (Ave. Kjeldahl Nitrogen without Acid of Manure)	Ave. Protein Origin Nitrogen, % (Proteinaceous Nitrogen)	Total Nitrogen Excretion of Protein Origin, %
Control	3.43	0.740	2.69	78.43
Alkacel 20x WS™	3.45	1.045	2.40	69.56
		Difference	-0.29	-8.86
		% Difference	-10.78	-11.30

ALKACEL 20X WITH 11.30% LOWER NITROGEN EXCRETION FROM PROTEIN ORIGIN
CONCRETE PROOF OF ENZYMATIC RELEASE OF TRAPPED PROTEIN IN FIBER MATRIX



NITROGEN CHAIN Protein Biologic Value Assay

BROILER INTEGRATOR TRIAL W/ ALKACEL 20X WS ENZYME 2015 PHIL.
 37,000 BIRDS/GROUP

TOTAL PROTEIN/N INTAKE

18,264 KG 18,685 KG
2,922 KG N 2,989 KG N

PROTEIN USED/ACCRETED	PROTEIN/N IN MANURE	PROTEIN/N IN URINE
5,797 KG	4,620 KG	7,846 KG
927 KG N	739 KG N	1,255 KG N
31.74%	25.30%	42.96%
6,293 KG	4,189 KG	8,202 KG
1,007 KG N	670 KG N	1,312 KG N
33.68%	22.42%	43.90%

Groups *Control *Treatment N = PROTEIN/6.25
Manure N = N of protein origin Urine N = Total Manure N – N of protein origin
Urine N adjusted = Total N intake – (N used + N in manure)
Protein/N used = Total LW x 0.3 x 0.33
**Mangalindan, J. et.al. 2016

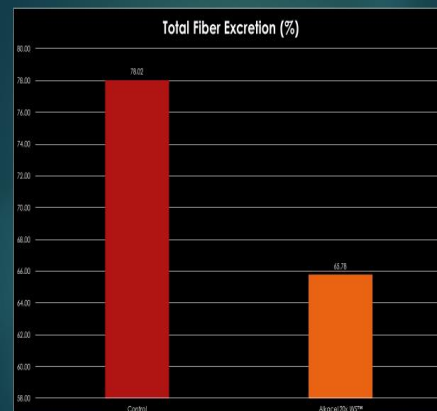
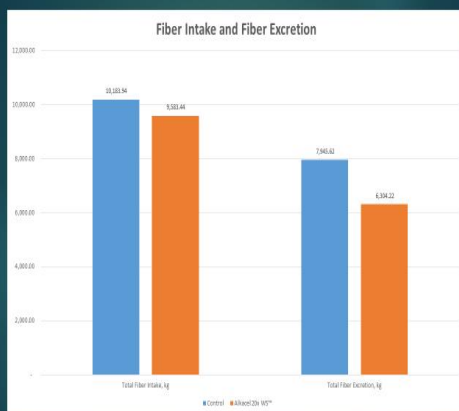
NDF/TOTAL FIBER ASSAY OF MANURE

	broiler Crumble	starter crumble	broiler grower	broiler finisher
NDF, ave.				
Control	23.13	31.33	31.87	29.49
Alkacel 20x ws	20.5	25.8	31.22	26.07
DIFFERENCE	-2.63	-5.53	-0.65	-3.42
% DIFF	-11.37	-17.65	-2.04	-11.60

Comparative Total Fiber Intake, and Total Fiber Excretion.

Group	Total Feed Intake, kg	Average NDF in Feeds, %	Total Fiber Intake, kg	Total Manure Excretion, kg	Average NDF in Manure, %	Total Manure Fiber Excretion, kg	Total Fiber Excretion, %
Control	91,050	11.185	10,183.94	27,465	28.95	7,945.62	78.02
Alkacel 20x WS™	87,600	10.94	9,583.44	24,350	25.89	6,304.22	65.78
					Difference	-1,641.41	-12.24
					% Difference	-20.66	-15.69

**ALKACEL 20X WITH 20.66% LOWER FIBER EXCRETION
CONCRETE PROOF OF SIGNIFICANT FIBER DIGESTION**



Comparative Total Feed Intake, Total Broiler Harvest Weight and Feed Conversion Ratio (FCR)

Group	Total Feed Intake (kg)	Total Broiler Harvest Weight (kg)	Feed Conversion Ratio
Control	91,050	59,568.35	1.53
Alkacel 20x WS™	87,600	63,555.50	1.39
Difference			-0.14
% Difference			-9.15

ALKACEL 20X WITH 9.15% BETTER FCR

Comparative Total Feed Intake, Total Broiler Harvest Weight and Feed Conversion Ratio (FCR)

Group	Total Feed Intake (kg)	Total Broiler Harvest Weight (kg)	Feed Conversion Ratio
Control	91,050	59,568.35	1.53
Alkacel 20x WS™	87,600	63,555.50	1.39
Difference			-0.14
% Difference			-9.15

ALKACEL 20X WITH 9.15% BETTER FCR

Mortality Rate

Group	Initial Population	Harvest Population	Mortality	Mortality Rate
Control	36,848	35,969	879	2.38%
Alkacel 20x WS™	36,608	35,956	652	1.78%
Difference			-227	-0.6%
% Difference			-25.82	-25.21%

ALKACEL 20X WITH 25.21% LOWER MORTALITY RATE

SMALLER, DRIER MANURE - INDISPUTABLE PROOF OF ENZYME ACTIVITY



BROILER MANURE UNTREATED



BROILER MANURE ALKACEL 20X WS ENZYME TREATED

IMPACT SUMMARY

LOWER FEED INTAKE	BY 3.79%
LOWER MANURE EXCRETION	BY 11.35%
LOWER PROTEIN EXCRETION	BY 13.11%
LOWER N EXCRETION	BY 11.09%
LOWER EXCRETION OF PROTEIN ORIGIN N (RELEASE OF TRAPPED PROTEIN IN FIBER)	BY 13.11%
LOWER MANURE FIBER	BY 20.66%
BETTER ADG	BY 6.52%
BETTER FCR	BY 9.15%
LOWER MORTALITY RATE	BY 25.21%

COST BENEFIT

ITEM	TOTAL FEED INTAKE, KG	COST/KG PhP AVE.	TOTAL COST	COST ALKACEL 20X ws	TOTAL HARVEST WEIGHT, KG	PRICE /KG	TOTAL VALUE	GROSS PROFIT AFTER FEED
CONTROL	91,050	25	2,276,250	0	59,568	75	4,467,600	2,191,350
ALKACEL	87,600	25	2,190,000	41,625	63,555	75	4,766,625	2,535,000
DIFFERENCE								+ 343,650
% DIFF.								+15.68%

NET DIFFERENCE/BIRD 9.29 pesos/bird ROI 1:8

*Alkacel 20X ws consumption at 0.75kg/500 birds day 1 to harvest (day 1 to 30), at 750pesos/kg

ALKACEL 20X ws

Water Soluble Targeted Enzyme Supplement for Poultry

Data from university, commercial and integrator farms trials reveal

IMPROVED FEED DIGESTIBILITY >30%

Reduced manure fiber content (NDF, ADF and HC) from 18%-38%

Reduced Protein/N excretion in manure by up to 24%

REDUCED DIRECT FEED COST AND FEED COST/GAIN UP TO 13%

Reduced Feed Intake up to 10%

Improved FCR up to 11%

Reduced feed cost/kg gain by up to 13%

REDUCED MANURE PRODUCTION BY UP TO 35%

REDUCED MORTALITY BY UP TO 32%

AT SIMILAR OR BETTER WEIGHT GAINS/ADG AS CONTROL

AGRIaccess Bothell WA USA

MAKE THE MOST OUT OF FEED!!!

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