Phytogenics: Plant power for a sustainable future

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Contents

- What are Phytogenics?
- Research methodology to develop phytogenics a snapshot
- Our research philosophy to develop phytogenics
- Application examples of phytogenics
 - Natural defense enhancer
 - Gut health
 - Greener alternative to chemical additives
- Advanced science to understand phytogenics
- Approach to sustainable use of phytogenics



PHYTOGENIC ADDITIVES ARE AVAILABLE IN Animal Phytogenics additives are botanical products designed to improve productivity and health of animals. **Different forms of PHYTOGENICS** XHOLF HERB BOTANICH SINGLE CONST PLANT EXTRAACTS AND OLE PURIFIED ESSENTIAL olls PHYTOGENICS



EVOLUTION OF KNOWLEDGE









Our Research Philosophy :

"Health or performance issues in animals are multi-factorial, so our intervention has to be multi-targeted".



Animal Health Problems are Multifactorial : Example, Gut problems





Multi-target Action or Poly-valency for better efficacy





Modified from Wagner H, 2009

Multi-target effect : Example

Oversupply of numericans in lumericans

Reed and digestion of nutrients

Shift in microbiota

Morphological & Ins Morphological & Ins Functional atterations

High feed intake high NSP levels mycotoxines, viruses etc

Presence of nutritional factors that favour some bacterial groups and causing disbalance



Inflammation and oxidative stress caused by interference of microbiota with mucosa





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Examples of Phytogenic application



Natural Defense Enhancers (Adaptogens) to manage modern animal production

STRESS

Stress is common in farm animals.

Common sources of stress include

- Environmental
- Nutritional / Feed
- Production demand
- Disease
- Managemental

Neuroendocrine changes

- Hypothalamus get secreted
- Pituitary gland gets stimulated
- † serum corticosterone

Adaptogens : Natural agents to mitigate stress

What is an adaptogen?

Adaptogens are stress response modifiers that increase an organism's nonspecific resistance to stress by increasing its ability to adapt and survive.

State of Non-Specific Resistance

SNSR



ADAPTOGENIC NRSBP



NR-SBP = Standardized Botanical Powder by Natural Remedies

Panossian and Wikman, 2010

Resistance

GLOBAL GENOMIC EFFECTS



Values are expressed as Mean \pm SEM; n=6-7; ^{abc}Means within the same column (a &b) bearing different superscripts were significantly different (p<0.05) based on One-way ANOVA followed by LSD test using SPSS

ADAPTOGENIC NRSBP REVERSED GLOBAL GENE EXPRESSION CHANGES INDUCED BY HEAT STRESS







Phytogenic solutions for Gut health of farm animals



Firmicutes vs Bacterriodetes



n=4-5; *p<0.05 as compared to Normal Control based on one-way ANOVA followed by Dunnett's Multiple Comparison Test







Reducing Feed costs by using greener alternatives

EFFECT CHOLINE ALTERNATIVE ON LIVER FAT LEVELS

Groups	Relative organ weight (g)	Liver lipids (mg/g liver tissue)				
	Liver	Total lipids	Triglycerides	Cholesterol		
MCS (10 ml/kg: 0.5% CMC)	2.71±0.11	43.80±3.49	4.54±1.31	1.22±0.20		
MCD (10 ml/kg: 0.5% CMC)	4.87±0.09*	241.02±10.14*	67.67±1.96*	19.52±2.36*		
MCD + PHF (50 mg/kg)	4.11±0.27*	158.41±27.93	33.09±7.36*	10.08±2.48		
MCD + PHF (100 mg/kg)	3.45±0.16*	124.11±10.81*	29.44±3.91*	9.31±1.71		
MCD + PHF (200 mg/kg)	3.69±0.13*	139.89±9.81#	37.56±1.79*	10.46±0.82		
MCD + PHF (400 mg/kg)	3.55±0.13*	157.41±16.30*	45.81±2.28*	11.18±1.63		

Values are expressed as mean±SEM; n=6. * $P \le 0.05$, MCD diet group versus MCS diet group, * $P \le 0.05$, treatment groups versus MCD diet groups. MCS: Methionine and choline sufficient; CMC: Carboxyl methyl solution; MCD: Methionine and choline deficient; PHF: Proprietary herbal formulation; SEM: Standard error of mean

Pharmacogn. Mag.

ORIGINAL ARTICLE

Evaluation of Lipotropic Effect of Herbal Formulation on Hepatic Fat Accumulation in Rats Fed with Methionine-Choline Deficient Diet

Prasanna Raja Chandrasekaran, Sasikumar Murugan, Edwin Jothie Richard, Bharathi Bethapudi, Divya Purusothaman, Chandrasekaran Chinampudur Velusami, Prashanth D'Souza', Deepak Mundkinajeddu, Muralidhar S. Talkad'

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APPLICATION OF NOVEL TECHNOLOGIES



Simultaneously examining genomics, metagenomes, transcriptomes and proteomes can give better understanding of the effect of Phytogenic additives and their mechanism of action



NGS sequencing



Proteomics





Metagenomics

Finished Goods to Raw Material Traceability





FG Batch No.	Top-Dow	n Analysis								
	多金 []	🕒 🔎 🖽 🗐 器 Top-Down	器 Bottom-Up	Documents	Respection Lots	Legend	Back	器 Batch	History	
	Top-Down Analys	is	T Material S	hort Text	·	Plant	Batch	Unit	Inspection	Vend.Batch
✓ Å 18T016		STODI 25	KG FINE POWDER	R (Taiwan)	1000	18T016	1.12/20050	l contra contra contra		
FG Process	• 11 480	0010460	🔒 STODI 25	KG FINE POWDER	R (Taiwan)	1000	18T016	NOS		
Order No.	- 83	18T016	STODI 25	KG FINE POWDER	R (Taiwan)	2000	18T016	NOS	Q	
Bulk Process Order No		a 110013699	STODI 25	KG FINE POWDER	R (Taiwan)	2000	18T016	NOS		
	•	🖧 18T022	NEW IMPR	OVED STODI BU	LK (FINE POWDER)	2000	18T022	KG		
		· 🖡 110013685	NEW IMPR	OVED STODI BU	LK (FINE POWDER)	2000	18T022	KG		
			BAHEDA (TERMINALIA BELL	ERICA)-CG	2000	1819GUT062	KG	C.	
			NASPAL F	RUITRIND (PUNIC	A GRANATUM) - CG	2000	0420180100	KG	C.	RHD-00131
		 & 0420180143 	KUDACHAI	(HOLARRHENA A	NTIDYSENTER)-CG(FS)	2000	0420180143	KG	C.	RHD-00231
	ss 🚺	 & 0420180153 	KUDACHAI	(HOLARRHENA A	NTIDYSENTER)-CG(FS)	2000	0420180153	KG	Ċ	RHD-00211
		• 8 0420180160	BABOOL C	HAL (ACACIA ARA	ABICA)- CG(FS)	2000	0420180160	KG	C.	RHD-00227
		RHD-00520	KALMEGH	-WP (ANDROGRA	PHIS PANICULATA)-CG	2000	RHD-00520	KG	C.	RHD-00520
		 819CUT251 	BABOOL G	UM (ACACIA ARA	BICA) - CS	2000	1819CUT251	KG	C	
	•	🖧 0320180602	STODI 25	Kg A3 Stkr LBL(T	AIWAN ASPI) FS	2000	0320180602	NOS	C.	GS180
	•	ali 0320180495	WHITE CR	APE PAPER - FS	(65MM)	2000	0320180495	KG	C.	1038
		Al 0320180500	POLY/COV	ER 23 45"X 2000	G[25kgs]-FS	2000	0320180500	KG	œ	2230
	•	8 0320180211	POLY/COV	ER 23 45"X 2000	G[25kgs]-FS	2000	0320180211	KG	C.	929
	•	8 0320180476	PLAIN 25	KGS EXPORT BOP	P BAG- FS	2000	0320180476	NOS	Q	153

RM Batch No.



Bulk Input RM List

Packing Material List

Agronomy- Sustainable supply chain





End to End process in herb cultivation





Land preparation



Plastic mulch + drip = saves water, Improves crop growth



Ready to transplant



Transplant in holes of the plastic mulch



Plant growth 45 days after transplant



Plant growth 90 days after transplant



Procurement







CAN YOU DIFFERENTIATE ?







QUALITY CONTROL PROCESS



- Microscopic
- TLC
- HPTLC

- Pesticide Residues
- Aflatoxins
- Residual solvents
- analysis

- Shelf life
- Thermal stability



