

CollaPlant Z NPNF[®]

VEGETABLE ALTERNATIVE FOR ANIMAL COLLAGEN



TABLE OF CONTENTS

VEGETABLE ALTERNATIVE FOR ANIMAL COLLAGEN

- Market Spotlight
- Introducing CollaPlant Z NPNF®
- Studies
 - Short Term in vivo Clinical Study
 - Long Term in vivo Clinical Study
 - Sensory Evaluation
 - Formulations



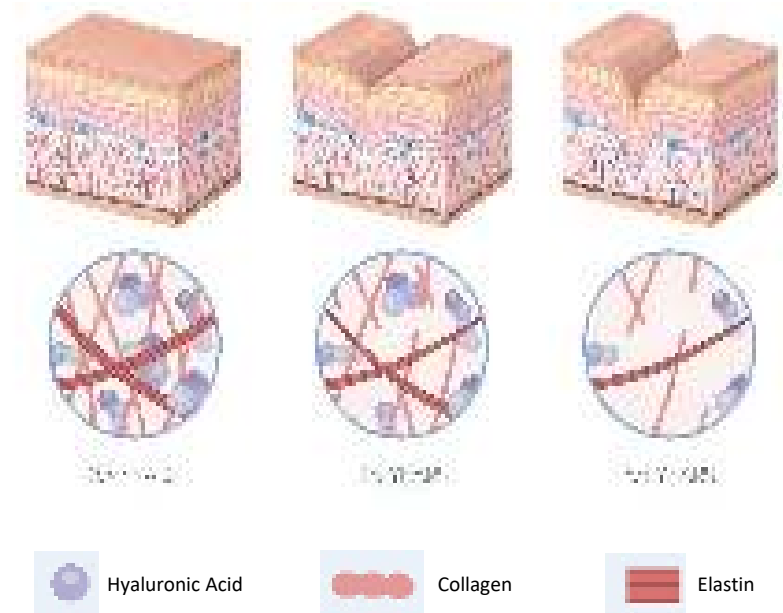
THE IMPORTANCE OF COLLAGEN

THE MOST ABUNDANT PROTEIN IN THE BODY

Collagen is a trusted ingredient in beauty & personal care for hair is derived from animal sources.

Collagen Functions:

- Acts as the glue that holds us together
- Maintains strength & elasticity of skin
- Popular claims for collagen containing products are moisturization & anti-aging
- As one ages, collagen levels decrease



GUILT-FREE COLLAGEN

LIMITED OPTIONS FOR VEGAN CONSUMERS

Collagen is derived from animal sources, such as cows or fish
Animal collagen alternatives must have the following attributes:



Vegan



Not Tested On Animals



Tensile Strength To The Hair



Similar Sensorial Attributes



Comparable Amino Acid Profile

VEGAN GOES MAINSTREAM

VEGAN ALTERNATIVES IN ALL ASPECTS

- In line with global shift for consumer pursuit of total health & wellness, **vegan, plant-based** and **vegetarian** interest is booming, moving from a niche concept to global megatrend
- Consumers not only turning to vegan diets, but **vegan personal care products** as well

According to a report by Grand View Research, the global market for **vegan cosmetics** is expected to reach **\$20.8 billion by 2025**



ETHICAL CONSUMERISM

COMPANIES ARE ADAPTING TO ALL VEGAN PRODUCT LINES



Today's consumers desire **clean ingredients** with concerns of animal welfare, sustainability and planet consciousness

A rise in veganism has resulted in **animal welfare** being a strong indicator of how ethical a brand is

Most studies indicate that beef-based products **generate more greenhouse gas emissions** than plant alternatives

SKINCARE INFUSED WITH COLLAGEN

The US market for **vegan cosmetics** is forecast to surpass **\$3bn** by the end of 2025

31%

Increase in skincare products containing collagen from 2021-2022

3000+

Global skincare product releases contained collagen in 2021

\$21.4bn

Vegan products are expected to be a \$21.4bn global market by 2027

VEGATABLE COLLEGEN GLOBAL SKIN PRODUCT LAUNCHES

Vegan is a top 7 skin care claim in GNPD for the past 3 years.



Truly
Tightening Butt & Leg Cream

A 3-step butt and leg tightening treatment made with a mixture of **age-defending** vanilla, **plant collagen**, and guarana whisked with ultra-hydrating ceramides + polyglutamic
(USA)



Pacifica Beauty
Creamy Gel Cleanse

Hydrating formula with **vegan collagen** and flower extracts claims to gently remove make-up and dirt and is suitable for all skin types and for daily use, is **free from sulfates and cruelty**
(UK)



Physicians Formula
24-Karat Gold Collagen Oil

Anti-aging, complexion-enhancing facial oil that deeply moisturizes, nourishes, and **rejuvenates the skin**, while restoring a youthful glow. Lightweight, quick-absorbing, skin-rejuvenating facial oil features **vegan collagen**
(Puerto Rico)

INTRODUCING **COLLAPLANT Z NPNF**[®]

VEGETABLE ALTERNATIVE FOR ANIMAL COLLAGEN

INCI: *Hydrolyzed Soy Protein, Rice Amino Acids, Hydrolyzed Adansonia Digitata Seed Extract, L-Proline*

BENEFITS:

- Fortifies **skin barrier** for maximum protection
- Improves **skin moisturization**
- **Smoothens & rejuvenates** for young looking skin

FEATURES:

- Specific vegetable complex designed to provide comparable amino acid composition & sensory profile of hydrolyzed collagen
- Comparable sensory profile to animal collagen
- Non-GMO, paraben & formaldehyde free
- Versatile for use in skin care applications



REGULATORY: Vegan, Cruelty-Free, Gluten-Free, GMO-Free, Paraben-Free, Formaldehyde-Free, Sulfate-Free

SUGGESTED USE LEVEL: 1-5%

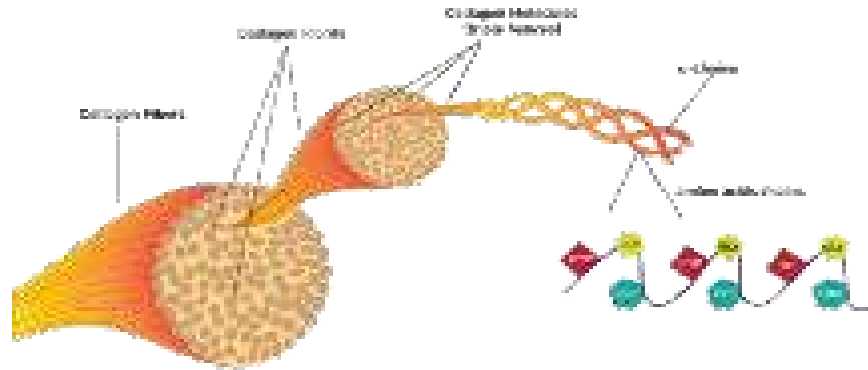
COLLAPLANT Z NPNF[®] TECHNICAL RATIONALE

COLLAPLANT Z NPNF[®] is a vegetable alternative to animal collagen specifically designed to provide **comparable amino acids composition & sensory profile** of Hydrolyzed Collagen

Normalized Amino Acid Composition Comparisons in Percentages

Amino Acids	CollaPlant Z NPNF [®]	Hydrolyzed Collagen
Arginine	4.0 - 8.0	7.0 - 11.0
Glutamic Acid	13.0 - 17.0	9.2 - 13.2
Glycine	17.0 - 21.0	24.6 - 28.6
Lysine	2.0 - 6.0	2.1 - 6.1
Proline	14.0 - 18.0	12.9 - 16.9
Valine	1.2 - 5.2	0.5 - 4.5

KEY AMINO ACID FUNCTIONALITY



Glycine

Promotes collagen synthesis & tissue repair

Proline

Promotes collagen synthesis & moisture retention

Arginine

Binds and holds water to skin for enhanced moisturization

Glutamic Acid

Increases synthesis of collagen

Lysine

Promotes collagen formation

COLLAPLANT Z NPNF[®]

COMPARISON STUDIES TO HYDROLYZED COLLAGEN

Study 1: Hydrolyzed Collagen v CollaPlant Z NPNF[®]
Sensory Evaluation

Study 2: Placebo v Hydrolyzed Collagen v CollaPlant Z NPNF[®]
Short Term In Vivo Protocol

Study 3: Placebo v Hydrolyzed Collagen v CollaPlant Z NPNF[®]
Long Term In Vivo Protocol

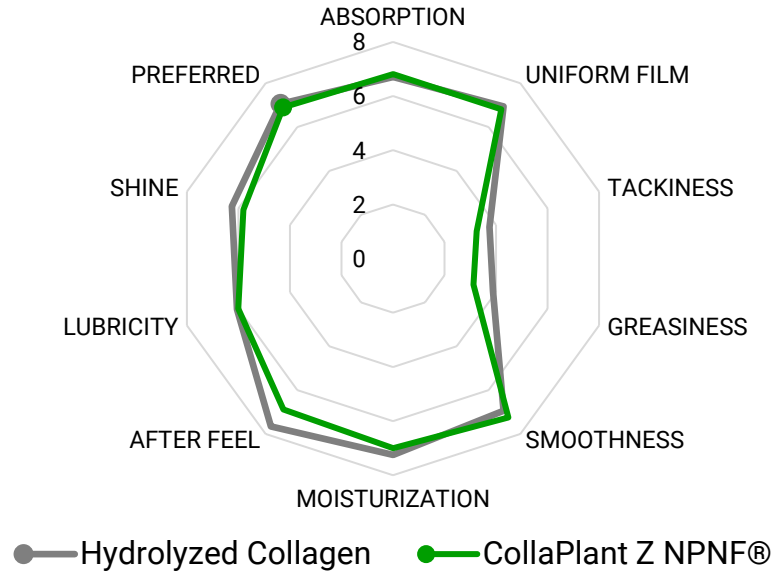


STUDY 1: SENSORY EVALUATION

Category	Study Protocol Design
Skin Site/ Volunteers	<ul style="list-style-type: none">•16 female volunteers•Hands (outer part)
Materials	<ul style="list-style-type: none">•Placebo Cream + 1% Hydrolyzed Collagen (Hydrolyzed Collagen)•Placebo Cream + 1% CollaPlant Z NPNF® (CollaPlant Z NPNF®)
Dosage	0.2 ml single application
Instrument(s)	Sensory Evaluation
Treatment Methods	<ul style="list-style-type: none">•Single blind randomized study•Each product was applied on the hands (outer part)•Panelists rubbed each treatment on the skin in a circular motion until product absorbed•Sensory evaluations were made after the products were absorbed•Sensory parameters : Absorption, Uniform film, Tackiness, Greasiness, Smoothness, Shine, Moisturization, Lubricity, After Feel, Preferred•10-point sensory rating scale (1 is low and 10 is high)
Test Conditions	Room Temperature: 21°C ± 2°C; Relative Humidity: 30 ± 10%

STUDY 1 RESULTS: SENSORY EVALUATION

CollaPlant Z NPNF® shows similar sensory profile to hydrolyzed collagen



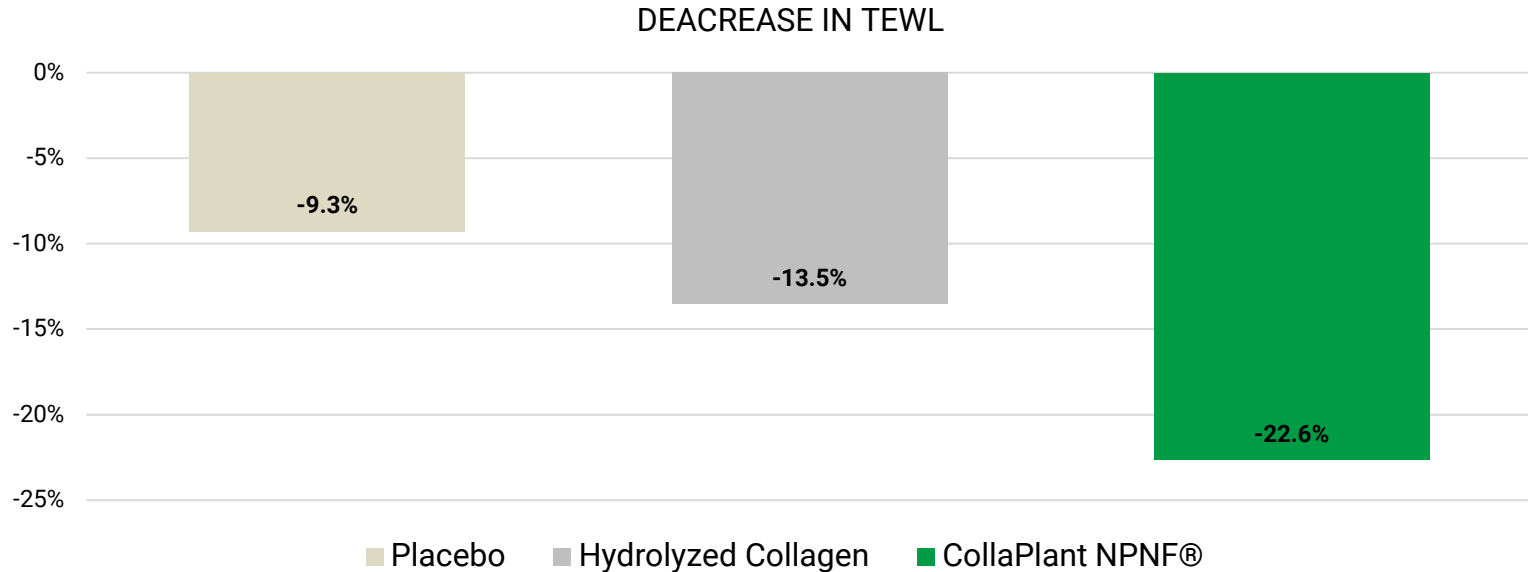
Single application, 1% in formulation

STUDY 2: SHORT TERM IN VIVO PROTOCOL

Category	Study Protocol Design
Skin Site/ Volunteers	<ul style="list-style-type: none">• 14 female volunteers (24 – 61 years old)• Volar forearms
Materials	<ul style="list-style-type: none">• Placebo Cream (Placebo)• Placebo Cream + 1% Hydrolyzed Collagen (Hydrolyzed Collagen)• Placebo Cream + 1% CollaPlant Z NPNF® (CollaPlant Z NPNF®)
Dosage	2.5 mg/cm ² single application
Instrument(s)	<ul style="list-style-type: none">• Tewameter® CM 850 (Courage + Khazaka)• Corneometer® CM 850 (Courage + Khazaka)
Treatment Methods	<ul style="list-style-type: none">• Single blind randomized study• Dry down period: 3 days before the study panelists washed their volar forearms once a day with a non-moisturizing soap bar to assess dry skin• Measurements were taken at baseline (Day 0) and 1 hour after application
Test Conditions	Room Temperature: 21°C ± 2°C; Relative Humidity: 30 ± 10%

STUDY 2A RESULTS: 1 HOUR IMPROVEMENT IN BARRIER FUNCTION

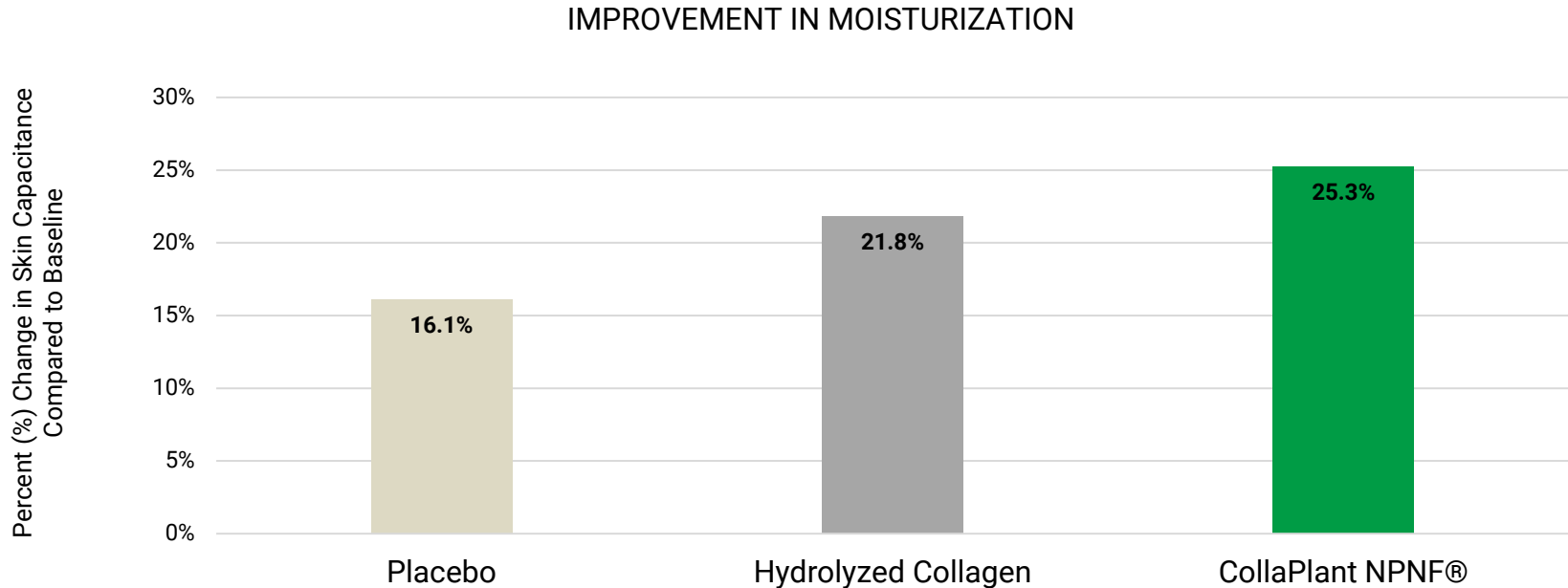
CollaPlant Z NPNF[®] strengthens barrier function when compared to placebo & hydrolyzed collagen



AFTER 1 HOUR, SINGLE APPLICATION, 1% IN FORMULATION

STUDY 2B RESULTS: 1 HOUR IMPROVEMENT IN MOISTURIZATION

CollaPlant Z NPNF® increases skin moisturization and skin health when compared to placebo & hydrolyzed collagen



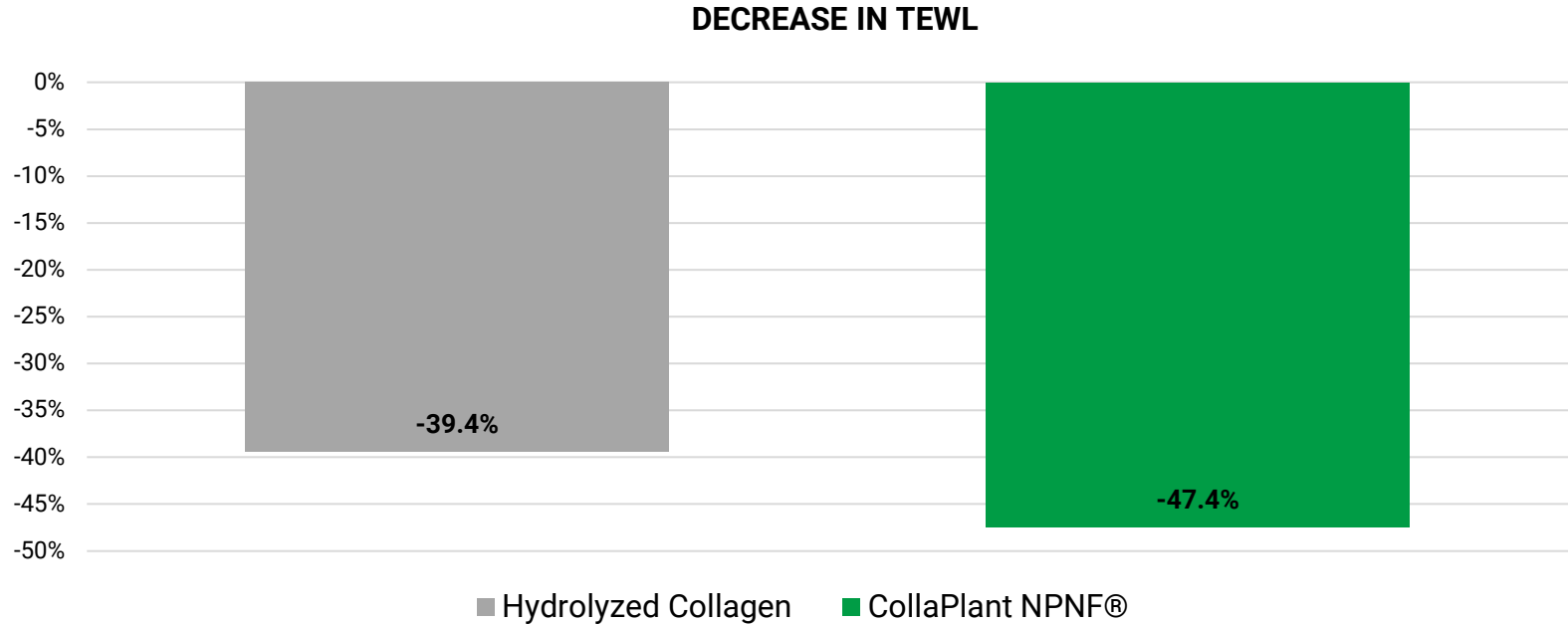
AFTER 1 HOUR, SINGLE APPLICATION, 1% IN FORMULATION

STUDY 3: LONG TERM IN VIVO STUDY PROTOCOL

Category	Study Protocol Design
Skin Site/ Volunteers	<ul style="list-style-type: none">• 13 female volunteers (24 – 61 years old)• Volar forearms
Materials	<ul style="list-style-type: none">• Placebo Cream + 1% Hydrolyzed Collagen (Hydrolyzed Collagen)• Placebo Cream + 1% CollaPlant Z NPNF® (CollaPlant Z NPNF®)
Dosage	5 mg/cm ² twice a day, morning and night for 14 days
Instrument(s)	<ul style="list-style-type: none">• Tewameter® CM 850 (Courage Khazaka)• Corneometer® CM 850 (Courage Khazaka)
Treatment Methods	<ul style="list-style-type: none">• Single blind randomized study• Dry down period: 5 days before the study panelists washed their volar forearms once a day with a non-moisturizing soap bar to assess dry skin• Measurements were taken at baseline (Day 0) and after 14 days
Test Conditions	Room Temperature: 21°C ± 2°C; Relative Humidity: 30 ± 10%

STUDY 3A RESULTS: IMPROVEMENT IN BARRIER FUNCTION

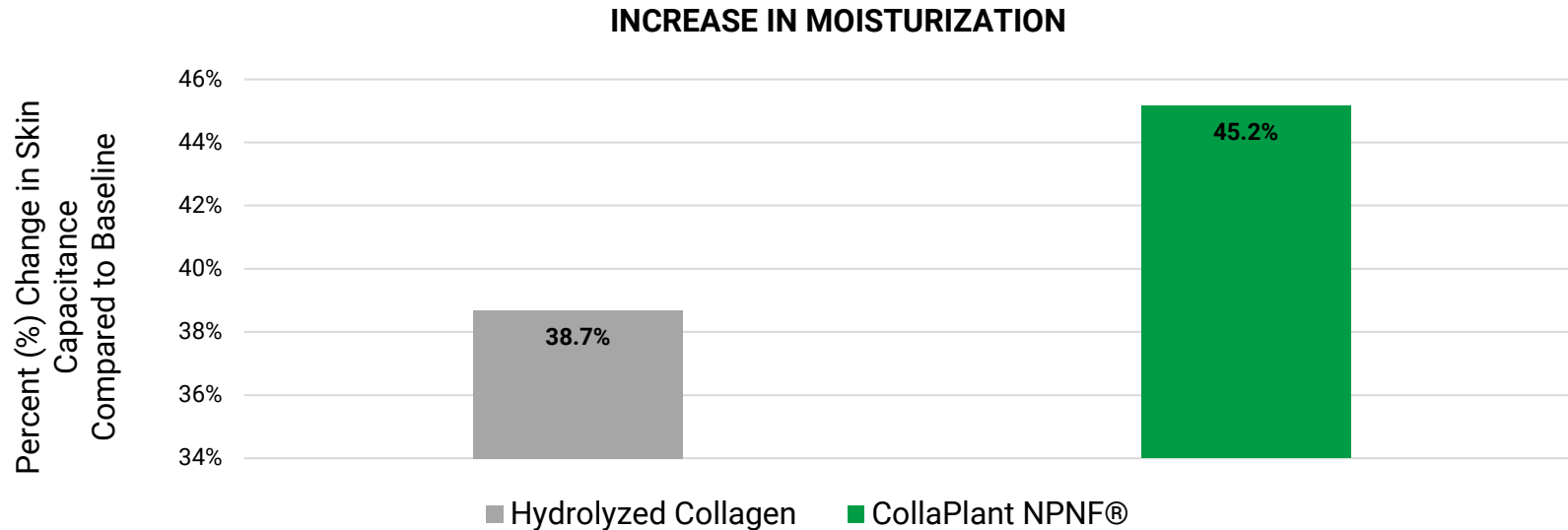
CollaPlant Z NPNF® improves skin barrier function over time when compared to hydrolyzed collagen



TWICE DAILY APPLICATION, 1% IN FORMULATION

STUDY 3B RESULTS: IMPROVEMENT IN MOISTURIZATION

CollaPlant Z NPNF® increases long term moisturization when compared to hydrolyzed collagen



** p < 0.05 compared to hydrolyzed collagen*

TWICE DAILY APPLICATION, 1% IN FORMULATION

COLLAPLANT Z NPNF[®] TECHNICAL SUMMARY

VEGETABLE ALTERNATIVE FOR ANIMAL COLLAGEN

INCI: *Hydrolyzed Soy Protein, Rice Amino Acids, Hydrolyzed Adansonia Digitata Seed Extract, L-Proline*

BENEFITS:

- Fortifies skin barrier for maximum protection
- Improves skin moisturization
- Smoothens & rejuvenates for young looking skin

FEATURES:

- Vegan collagen alternative
- Specific vegetable complex designed to provide comparable amino acid composition & sensory profile of hydrolyzed collagen
- Comparable sensory profile to animal collagen
- Non-GMO, paraben & formaldehyde free
- Versatile for use in skin care applications



SUGGESTED APPLICATIONS: Creams, lotion, shaving creams, liquid detergents, face/body wash, nail treatment products

SUGGESTED USE LEVEL: 1-5%



Formulation Collection

SKINCARE

Formulation #1 - Good Morning! Moisturizer

Phase	INCI Name/Chemical Name	Trade Name	Supplier	Percentage (%)
A	Water	Water		77.69
	Xanthan Gum	Vanzan NF-C	R.T. Vanderbilt	0.20
	Glycerin	Glycerin		3.00
	Tetrasodium Glutamate Diacetate	BioPure™ GLDA	Jarchem Industries Inc.	0.10
B	Sodium Acrylate/Sodium Acryloyl Dimethyl Taurate Copolymer, Cetyl Alcohol, Glycol Stearate, Glyceryl Stearate, Caprylic/Capric Triglyceride	Jeesperse® ICE-T™ LB-TNS	Jeen® International Corporation	4.00
	Squalane	OleaClear Olive Squalane	TRI-K Industries, Inc.	2.00
	Hydrogenated Ethylhexyl Olivatate, Hydrogenated Olive Oil Unsaponifiables	Fision® EcoSil	TRI-K Industries, Inc.	3.00
	Isopropyl Myristate NF	Jeechem IPM NF	Jeen® International Corporation	2.50
	Caprylic/Capric Triglycerides	GalMOL CCT	Galaxy Surfactants, Ltd.	2.00
	Tocopheryl Acetate	Vitamin E Acetate	TRI-K Industries, Inc.	0.20
C	Hydrolyzed Soy Protein, Rice Amino Acids, Hydrolyzed Adansonia Digitata Seed Extract, L-Proline	CollaPlant Z NPNF®	TRI-K Industries, Inc.	2.00
	Water, Sodium Hyaluronate	HyaClear® Solution	TRI-K Industries, Inc.	2.00
	Phenoxyethanol, Undecylenoyl Glycine, Capryloyl Glycine	Galguard Trident	TRI-K Industries, Inc.	1.20
	Colorante- Naturel	Green Color	Siddha Medico-Color	0.10
	Eucalyptus Globulus 80/85 Essential Oil	Eucalyptus Globulus 80/85 Essential Oil	Elixens	0.01

Formulation #2 – Under Eye-Conic Gel

Phase	INCI Name/Chemical Name	Trade Name	Supplier	Percentage (%)
A	Water	Water		87.85
	Carbomer	Carbopol® Ultrez 30 Polymer		0.40
	Glycerin	Glycerin		2.00
	Ammonium Acryloyldimethyltaurate/VP Copolymer	Aristoflex® AVC		1.25
	Tetrasodium Glutamate Diacetate	BioPure™ GLDA	Jarchem Industries Inc.	0.10
B	Hydrolyzed Soy Protein, Rice Amino Acids, Hydrolyzed Adansonia Digitata Seed Extract, L-Proline	CollaPlant Z NPNF®	TRI-K Industries, Inc.	2.00
	Water, Sodium PCA, Wheat Amino Acids, Glycerin, Panthenol, Sodium Hyaluronate, Hydroxyproline	Fision® Hydrate	TRI-K Industries, Inc.	2.00
	Chenopodium Quinoa Seed Extract	NaturePep® Quinoa	TRI-K Industries, Inc.	2.00
	Phenoxyethanol, Caprylyl Glycol	TRISat PCG	TRI-K Industries, Inc.	1.00
	Mica (and) Titanium Dioxide	Flamenco® Velvet	BASF Colors & Effects	0.50
	Colorante- Naturel	Red Color		0.20
	Sodium Hydroxide	Sodium Hydroxide 10% Solution		0.70

Thank you



QUESTIONS?

Appendix

Formulation for Skin Clinical Studies & Sensory Evaluation

INCI Name/Chemical Name	Trade Name	Supplier	Percentage (%) Product A	Percentage (%) Product B
Phase A				
Water			88.40	88.40
Carbomer	Carbopol® 980	The Lubrizol Corporation	0.30	0.30
Glycerin			1.00	1.00
Disodium EDTA	VERSENE™ Na2 Crystals	The Dow Chemical Company	0.05	0.05
Phase B				
Cetearyl Alcohol and Ceteareth 20	JEECOL CS-20D	Jeen® International Corporation	2.00	2.00
Isopropyl Palmitate			5.00	5.00
Glyceryl Stearate			1.00	1.00
Phase C				
Triethanolamine	Triethanolamine 99%	Jeen® International Corporation	0.25	0.25
Phase D				
Preservative			1.00	1.00
Water, Hydrolyzed Soy Protein, Rice Amino Acids, Hydrolyzed Adansonia Digitata Seed Extract, L-Proline	CollaPlant Z NPNF®	TRI-K Industries, Inc.	1.00	0.00
Hydrolyzed Collagen	Colla Tein N55 NPNF®	TRI-K Industries, Inc.	0.00	1.00

References

1. <https://clients.mintel.com/insight/veganism-meets-home-care-1>
2. <https://www.bbc.com/news/business-44488051>
3. <https://www.theguardian.com/lifeandstyle/2018/apr/01/vegans-are-coming-millennials-health-climate-change-animal-welfare>
4. <https://www.buzzworthy.com/whats-driving-the-vegan-trend/>
5. <http://theconversation.com/the-vegans-are-coming-whats-fuelling-the-interest-in-plant-based-eating-123869>
6. Mintel

FORMULATION PROCEDURES

GOOD MORNING! MOISTURIZER

1. Premix Vanzan Gum with Glycerin, then add them to the water. Mix until hydrate.
2. Heat to 50°C. Add remaining ingredient of phase A.
3. Add Phase B ingredients and mix well until uniform.
4. Cool the batch to 40°C, add Phase C ingredients. Mix well until uniform.

UNDER EYE-CONIC GEL

1. Add Phase A ingredients heat to 70-75°C.
2. Combine Phase B ingredients and heat to 70-75°C. Add Phase B to Phase A and mix well.
3. Homogenize for 3 minutes.
4. Cool batch to 40°C add phase C.

What is Driving Veganism?

- **Weight management**

- Arguably the most common reason for choosing to live as a vegan are the **health benefits** associated with the lifestyle⁴

- **Animal Welfare**

- **Environmental concerns²**

- Meat production places an enormous strain on the environment, everything from the grain the animals eat and the water they consume, to the land they live on, to the greenhouse gases they emit⁴

- **Growing number of young people are trying out vegan diets for personal health reasons (39% of generally young, generally female Veganuary participants)³**

- **Celebrity endorsements & social media**

❖ **49%** of adults surveyed (in Great Britain by Mintel) say they are interested in cutting meat for health reasons