

Summary of Cynatine® HNS Clinical Trial - Results on Hair

► INTRODUCTION

- This study is a double blind Placebo controlled clinical study carried out on 50 male and 50 female subjects aimed at evaluating the efficacy of a food supplement, Cynatine® HNS, to help improve the conditions of hair.
- 5 tests were conducted to evaluate the impact of Cynatine in hair health.

► I. HAIR PULL TEST

- The Hair Pull Test evaluates hair loss from every day activity such as washing and brushing. Gentle traction is provided to a total of approximately 60 hairs in three areas of the scalp and the total number of hairs extracted is counted.
- Healthy hairs in the anagen phase should remained rooted, while hairs in the telogen phase should be extracted.

Table 1a. Results of Hair-Pull Test on Overall subjects

Pull Test Score	Study Group Overall (male + female subjects)		
	Cynatine® HNS group Mean ± SD	Placebo group Mean ± SD	p-value intergroup (Cynatine® HNS vs. Placebo)
Baseline	12,9 ± 0,3	13,0 ± 0,3	
Day 30	9,8 ± 0,2	11,9 ± 0,3	
Day 60	7,2 ± 0,2	11,6 ± 0,2	
Day 90	6,9 ± 0,1	10,9 ± 0,2	
Change to Baseline (%):			
Day 30	-23,9%	-7,5%	p < 0,001
Day 60	-43,2%	-9,4%	p < 0,001
Day 90	-45,5%	-15,8%	p < 0,001

Intergroup values determined by t-test of Student, p < 0.05 are significant

Table1b. Results of Hair-Pull Test on Female and Male subjects

Pull Test Score	Study Groups					
	female subjects			male subjects		
	Cynatine group Mean ± SD	Placebo group ± SD Mean	p-value (Cynatine® HNS vs. Placebo)	Cynatine group Mean ± SD	Placebo group ± SD Mean	p-value (Cynatine® HNS vs. Placebo)
Baseline	13,1 ± 0,4	12,8 ± 0,3		12,8 ± 0,4	13,2 ± 0,4	
Day 30	9,6 ± 0,3	11,5 ± 0,4		9,9 ± 0,3	12,4 ± 0,4	
Day 60	6,9 ± 0,3	11,5 ± 0,2		7,5 ± 0,2	11,8 ± 0,3	
Day 90	7,0 ± 0,2	10,6 ± 0,3		6,9 ± 0,1	11,1 ± 0,3	
Change to Baseline (%):						
Day 30	-25,8%	-9,2%	p < 0,001	-21,9%	-5,7%	p < 0,001
Day 60	-46,2%	-9,0%	p < 0,001	-40,1%	-9,9%	p < 0,001
Day 90	-45,8%	-16,3%	p < 0,001	-45,2%	-15,4%	p < 0,001

Intergroup values determined by t-test of Student, p < 0.05 are significant

Figure 1a. : Results of Hair Pull Test for overall subjects; mean % reduction from baseline for Cynatine® HNS and Placebo.

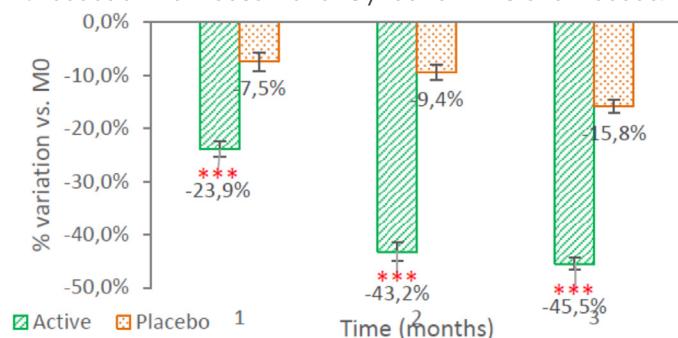


Figure 1b. : Hair pull test for female subjects; mean % reduction from baseline for Cynatine® HNS and Placebo

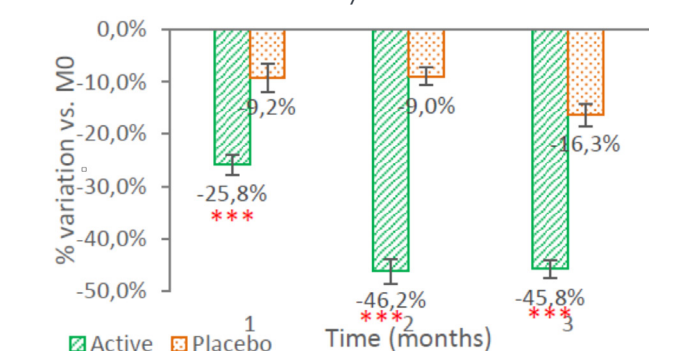
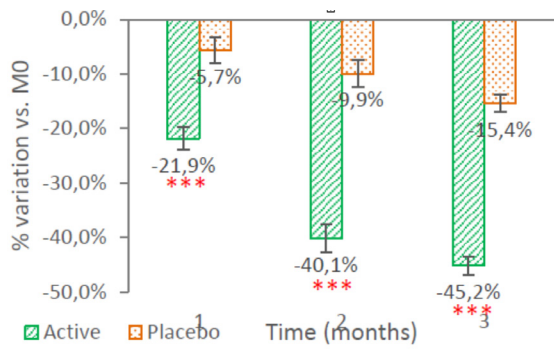


Figure 1c. : Hair pull test for male subjects; mean % reduction from baseline for Cynatine® HNS and Placebo



*** p < 0.001 between groups to baseline

Conclusion for overall population and in female and male groups:

- Cynatine® HNS reduced hair loss around 3 times more than Placebo at 30, 60 and 90 days.
- Cynatine® HNS showed a statistically significant decrease in hair loss vs. Placebo at 30, 60 and 90 days with p value < 0.001.

- ✓ Reduced hair loss from everyday activities.
- ✓ Reduced hair loss from everyday activities can be seen even within 30 days.
- ✓ Supports Healthy Hair Growth.

▶ II. ANAGEN/TELOGEN PHASE HAIR TEST

- In order to measure the number of hairs in the Anagen and Telogen phase of the hair cycle a 1.8cm² patch of hair was shaved and dyed for contrast.
- Photos were taken immediately after shaving and then again after 2 days using a close-up digital camera.
- Computer software then analyzed the two pictures and could determine how many hair were growing (Anagen phase) and how many hair died (Telogen phase).

Table 2a. Results of Anagen/Telogen Phase Test on overall subjects

Anagen / Telogen score	Study Group Overall (male + female subjects)				p-value (Cynatine® HNS vs. Placebo)
	Cynatine® HNS group Mean ± SD		Placebo group Mean ± SD		
	Anagen	Telogen	Anagen	Telogen	
Baseline	72,3% ± 0,1	27,7% ± 0,1	72,8% ± 0,1	27,2% ± 0,1	
Day 90	84,1% ± 0,2	15,9% ± 0,2	75,3% ± 0,1	24,7% ± 0,1	
Change to Baseline (%)					p < 0,001
Day 90	+11,8%	-11,8%	+2,5%	-2,5%	

Intergroup values determined by t-test of Student, p < 0.05 are significant.

Table 2b. Results of Anagen/Telogen Phase Test on female and male subjects

Anagen / Telogen score	female subjects				p-value (active vs. Placebo)	male subjects				p-value (active vs. Placebo)
	Cynatine® HNS group Mean ± SD		Placebo group Mean ± SD			Cynatine® HNS group Mean ± SD		Placebo group Mean ± SD		
	Anagen	Telogen	Anagen	Telogen		Anagen	Telogen	Anagen	Telogen	
Baseline	72,9% ± 0,2	27,1% ± 0,2	73,0% ± 0,1	27,0% ± 0,1	p < 0,001	71,8% ± 0,2	28,2% ± 0,2	72,7% ± 0,2	27,3% ± 0,2	p < 0,001
Day 90	85,3% ± 0,2	14,7% ± 0,2	75,5% ± 0,1	24,5% ± 0,1		82,9% ± 0,2	17,1% ± 0,2	75,1% ± 0,1	24,9% ± 0,1	
Change to Baseline (%)					p < 0,001					p < 0,001
Day 90	+12,4%	-12,4%	+2,5%	-2,5%		+11,1%	-11,1%	+2,4%	-2,4%	

Intergroup values determined by t-test of Student, p < 0.05 are significant.

Figure 2a. Anagen/Telogen Phase Test for overall subjects ; mean % reduction from baseline for Cynatine® HNS and Placebo

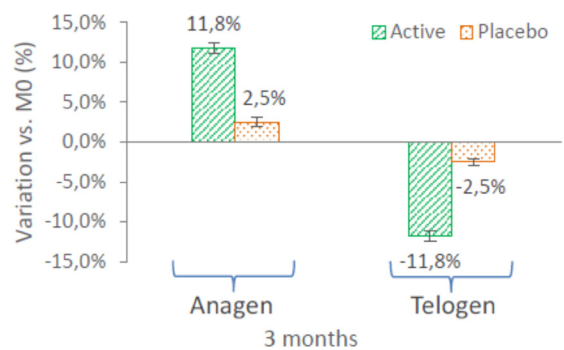


Figure 2b. Anagen/Telogen Phase Test for female subjects ; mean % reduction from baseline for Cynatine® HNS and Placebo

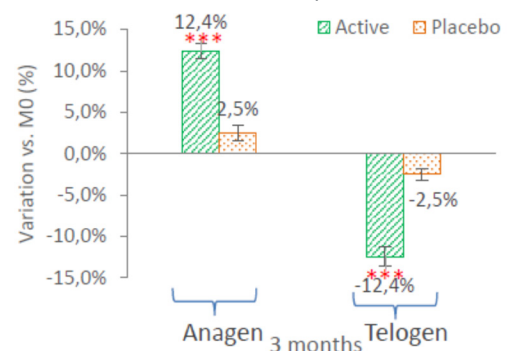
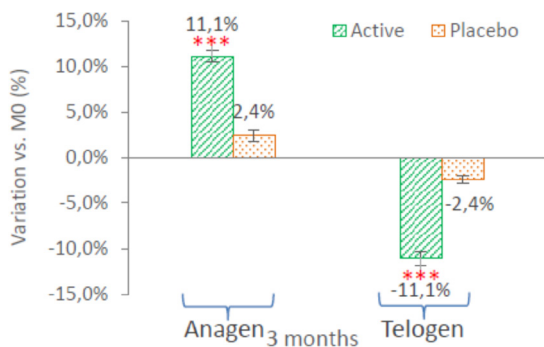


Figure 2c. Anagen/Telogen Phase Test for male subjects ; mean % reduction from baseline for Cynatine® HNS and Placebo



Conclusion for overall population and in female and male groups:

- Cynatine® HNS increases the number of hair in the Anagen phase and reduces the number of hair in Telogen phase after 90 days.
- Cynatine® HNS vs. Placebo showed results that were statistically very significant at 90 days on the global population as well as on men and women.
- Cynatine® HNS's effect over Placebo was greater than 4.5 times more for all groups.

✓ Cynatine® HNS supports healthy hair growth

▶ III. AMINO ACID ANALYSIS OF HAIR

- Hair samples are taken from individuals and their amino acid profiles are analyzed by reverse phase liquid chromatography (results reported as % of total protein content).
- The quantities of the important amino acids which play a role in hair health (Serine, Glutamic Acid, Cystine and Methionine) have been measured below:

Table 3a. Results of the amino acid test on overall subjects

Amino Acid Score	Study Group Overall								p value between groups (Cynatine® HNS vs. Placebo):
	Cynatine® HNS				Placebo				
	Serine	Glutamic Acid	Cystine	Methionine	Serine	Glutamic Acid	Cystine	Methionine	
Baseline	11,0 ± 0,4	14,3 ± 0,4	17,4 ± 0,4	1,1 ± 0,1	11,3 ± 0,4	13,9 ± 0,5	17,8 ± 0,5	1,2 ± 0,1	for all values p < 0,001
Day 90	15,4 ± 0,5	18,1 ± 0,4	26,8 ± 0,6	4,7 ± 0,2	11,7 ± 0,3	14,1 ± 0,5	16,9 ± 0,4	1,2 ± 0,1	
Change to Baseline:	Mean % ± SD %								
Day 90	+4,5%	+3,8%	+9,4%	+3,6%	+0,4%	+0,2%	-0,8%	+0,0%	
p value (vs. baseline)	p < 0,001	p < 0,001	p < 0,001	p < 0,001	n.s.	n.s.	n.s.	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Table 3b. Results of the amino acid test on female subjects

Amino Acid Score	Study Group female subjects								p value between groups (Cynatine® HNS vs. Placebo):
	Cynatine® HNS				Placebo				
	Serine	Glutamic Acid	Cystine	Methionine	Serine	Glutamic Acid	Cystine	Methionine	
Baseline	11,1 ± 0,6	14,5 ± 0,5	17,1 ± 0,5	1,1 ± 0,1	11,5 ± 0,5	14,0 ± 0,7	17,6 ± 0,6	1,2 ± 0,1	for all values p < 0,001
Day 90	15,9 ± 0,8	18,2 ± 0,6	27,0 ± 0,8	4,7 ± 0,3	11,8 ± 0,4	14,2 ± 0,8	16,9 ± 0,6	1,3 ± 0,1	
Change to Baseline:	Mean % ± SD %								
Day 90	+4,7%	+3,7%	+9,9%	+3,5%	+0,3%	+0,2%	-0,8%	0,1%	
p value (vs. baseline)	p < 0,001	p < 0,001	p < 0,001	p < 0,001	n.s.	n.s.	n.s.	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Table 3c. Results of the amino acid test on male subjects

Amino Acid Score	Study Group male subjects								p value between groups (Cynatine® HNS vs. Placebo):
	Cynatine® HNS				Placebo				
	Serine	Glutamic Acid	Cystine	Methionine	Serine	Glutamic Acid	Cystine	Methionine	
Baseline	10,8 ± 0,5	14,1 ± 0,6	17,7 ± 0,6	1,1 ± 0,1	11,1 ± 0,5	13,9 ± 0,6	17,9 ± 0,7	1,1 ± 0,1	for all values P < 0,001
Day 90	15,0 ± 0,7	18,1 ± 0,6	26,6 ± 0,8	4,8 ± 0,3	11,5 ± 0,5	14,1 ± 0,7	17,0 ± 0,6	1,2 ± 0,1	
Change to Baseline:	Mean % ± SD %								
Day 90	+4,3%	+4,0%	+8,9%	+3,7%	+0,4%	+0,2%	-0,9%	0,1%	
p value (vs. baseline)	p < 0,001	p < 0,001	p < 0,001	p < 0,001	n.s.	n.s.	n.s.	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Figure 3a. Serine Content – Overall subject

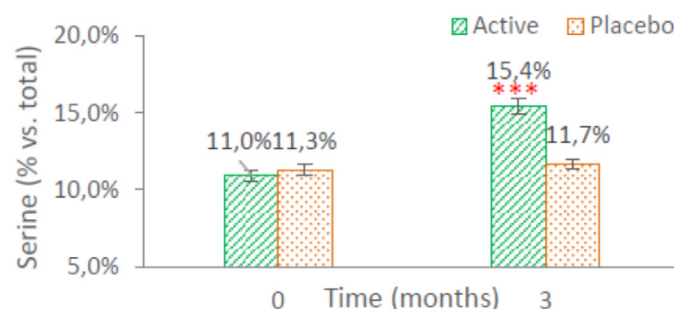


Figure 3b. Serine Content – Female subject

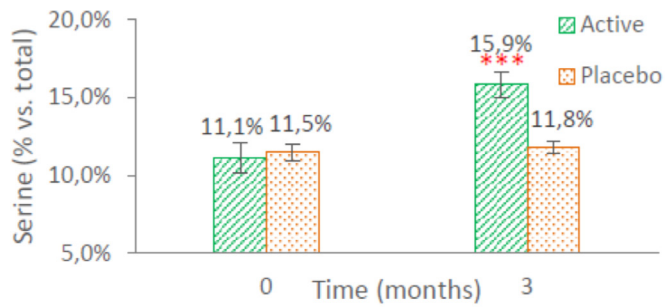


Figure 3a Serine Content – male subject

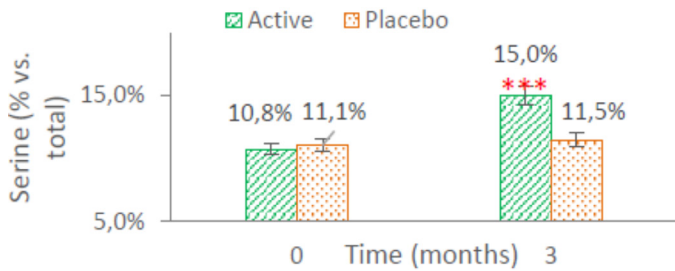


Figure 4a. Glutamic Acid Content – Overall subject

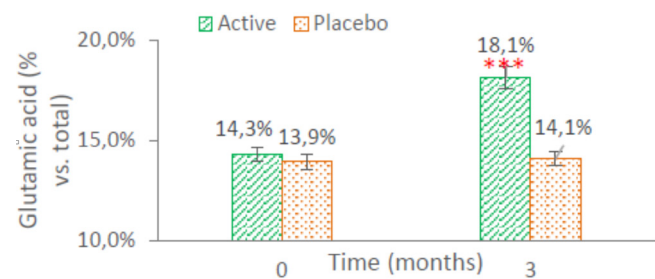


Figure 4b. Glutamic Acid Content – Female subject

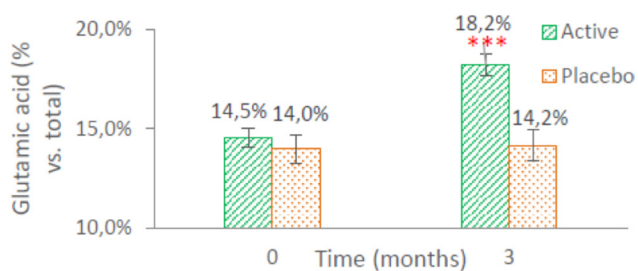


Figure 4c. Glutamic Acid Content – Male subject

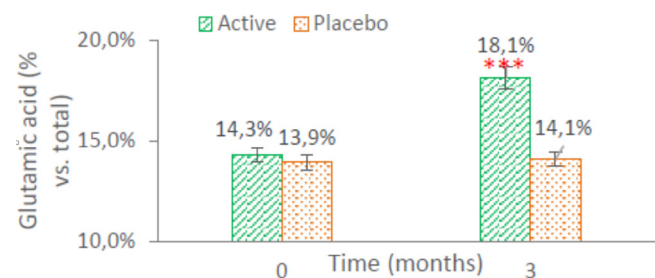


Figure 5a. Cystine Content – Overall subject

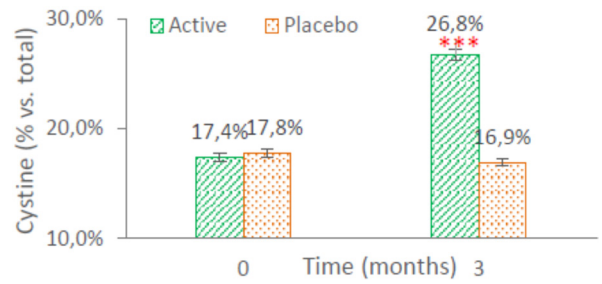


Figure 5b. Cystine Content – Female subject

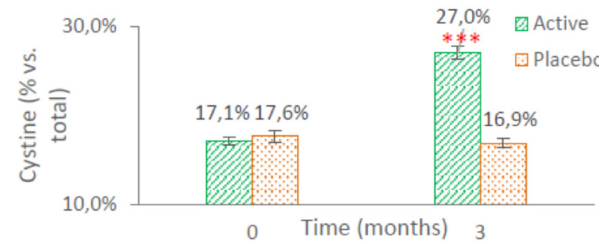


Figure 5c. Cystine Content – Male subject

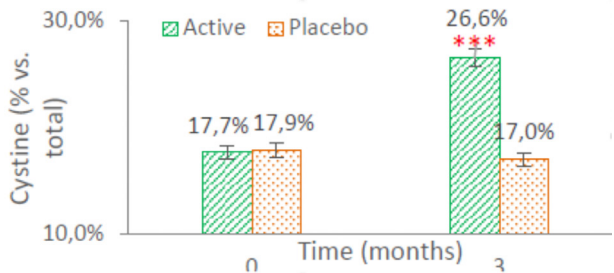


Figure 6a. Methionine Content – Overall subject

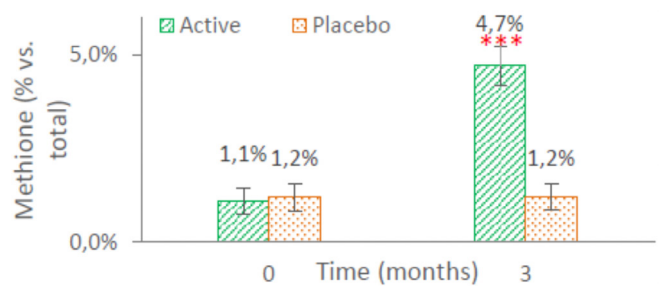


Figure 6b. Methionine Content – Female subject

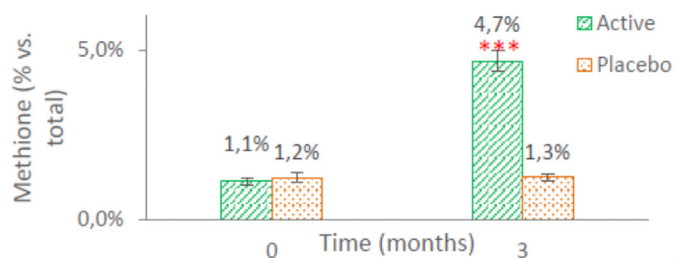
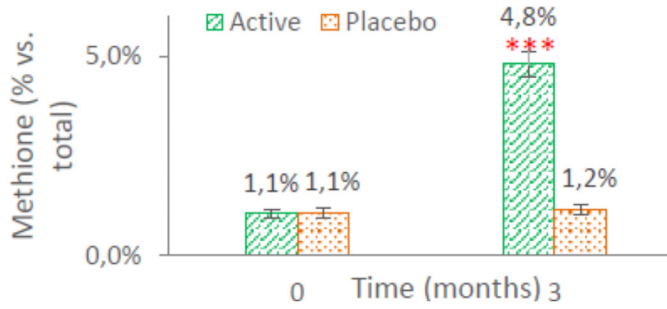


Figure 6c. Methionine Content – Male subject



p < 0.001 for all amino acids content as variation vs MO only in Cynatine® HNS group.

Figure 7a. Mean % change in amino acid profil after 90 days – Overall subjects

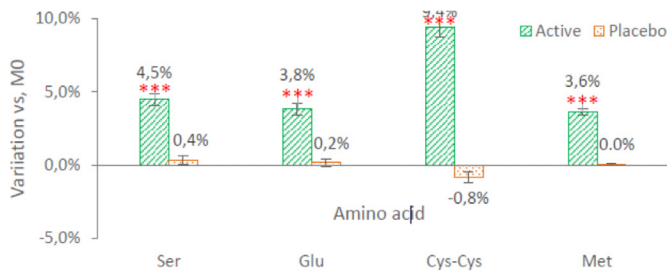


Figure 7b. Mean % change in amino acid profil after 90 days – Female subjects

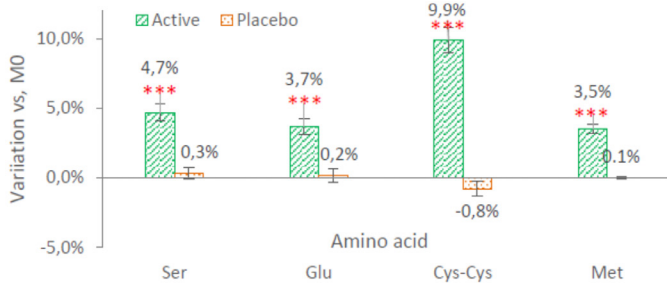
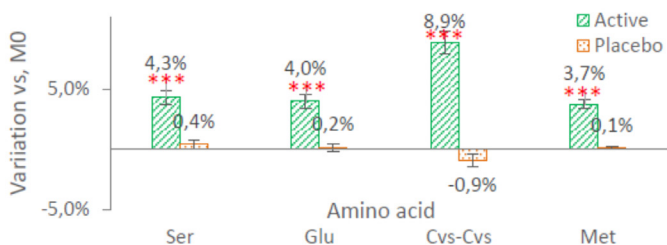


Figure 7c. Mean % change in amino acid profil after 90 days – Male subjects



*** p < 0.001 between groups to baseline

Conclusion for overall population and in female and male groups:

- Cynatine® HNS increases the amino acid content of Serine, Glutamic acid, Cystine and Methionine after 90 days.
- Cynatine® HNS showed results that were statistically significant versus baseline and versus Placebo at 90 days.
- The ability of the hair to absorb the amino acids from Cynatine® HNS shows its bioactivity.

- ✓ Cynatine® HNS supports healthy hair growth.
- ✓ Cynatine® HNS improves the structure of the hair.
- ✓ Cynatine® HNS is bioactive.

IV. RESISTANCE TO TRACTION

- The strength of the hair is measured by dynamometer and recorded in centiNewtons.
- The stronger the hair, the more force it will take to break.

Table 4a. Results of the resistance to traction test on Overall subjects

Resistance to traction score	Study Group Overall (male + female subjects)		p-value (Cynatine® HNS vs. Placebo)
	Cynatine® HNS group Mean ± SD	Placebo group Mean ± SD	
Baseline	71,7 cN ± 1,1	71,2 cN ± 1,1	
Day 90	78,1 cN ± 1,1	71,6 cN ± 1,1	
Change to Baseline (cN):			
Day 90	+6,3 cN	+0,4 cN	p < 0,001
p value (vs. baseline)	p < 0,001	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Table 4b. Results of the resistance to traction test on Female subjects

Resistance to traction score	Study Group female subjects		p-value (Cynatine® HNS vs. Placebo)
	Cynatine® HNS group Mean ± SD	Placebo group Mean ± SD	
Baseline	73,1 cN ± 1,4	71,7 cN ± 1,6	
Day 90	79,4 cN ± 1,5	72,7 cN ± 1,5	
Change to Baseline (cN):			
Day 90	+6,3 cN	+0,9 cN	p < 0,001
p value (vs. baseline)	p < 0,001	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Table 4c. Results of the resistance to traction test on Male subjects

Resistance to traction score	Study Group male subjects		p-value (Cynatine® HNS vs. Placebo)
	Cynatine® HNS group Mean ± SD	Placebo group Mean ± SD	
Baseline	70,4 cN ± 1,6	70,7 cN ± 1,6	
Day 90	76,8 cN ± 1,7	70,5 cN ± 1,7	
Change to Baseline (cN):			
Day 90	+6,4 cN	- 0,1 cN	p < 0,001
p value (vs. baseline)	p < 0,001	n.s.	

Intragroup and intergroup values determined by RM-ANOVA and t-test of Student, p < 0.05 are significant.

Figure 8a. Hair resistance to traction results for Cynatine® HNS and Placebo – Overall Subjects

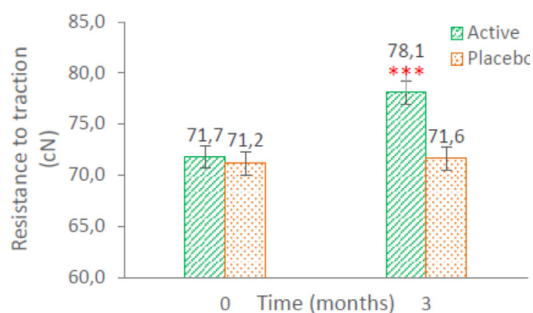


Figure 8b. Hair resistance to traction results for Cynatine® HNS and Placebo – Female Subjects

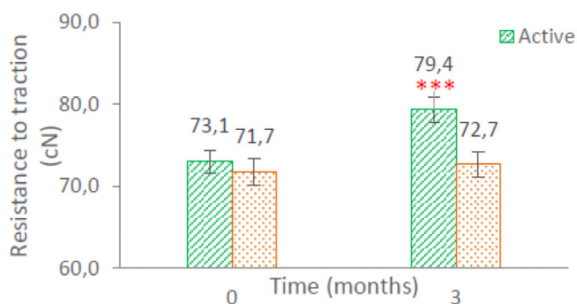
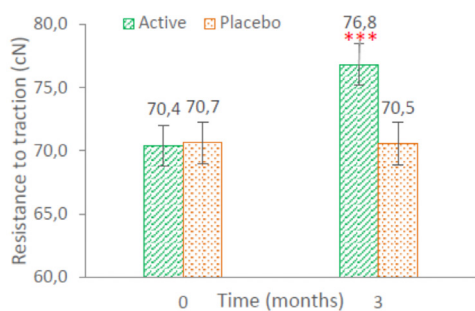


Figure 8c. Hair resistance to traction results for Cynatine® HNS and Placebo – Male Subjects



*** p < 0.001 within group to baseline

Figure 9a. Mean variation vs. MO in resistance to traction for Cynatine® HNS and Placebo – Overall subjects

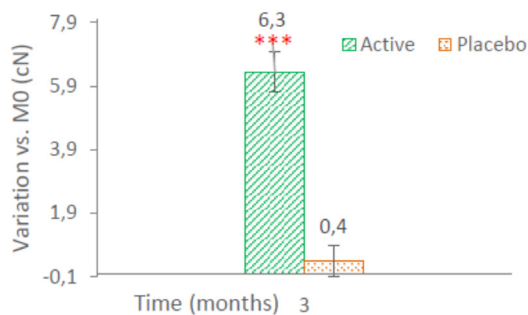


Figure 9b. Mean variation vs. MO in resistance to traction for Cynatine® HNS and Placebo – Female subjects

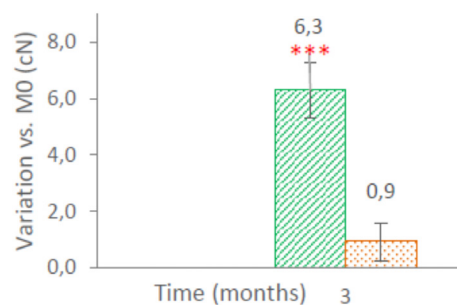
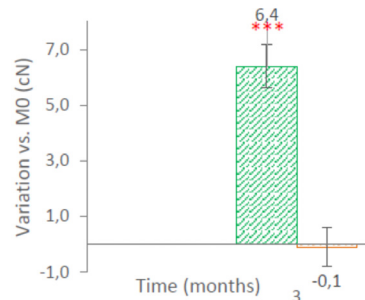


Figure 9c. Mean variation vs. MO in resistance to traction for Cynatine® HNS and Placebo – Male subjects



*** p < 0.001 between groups to baseline

Conclusion for overall population and in female and male groups:

- Cynatine® HNS increases the strength of hair (approximately 9% in all groups) after 90 days.
- Cynatine® HNS showed results that were statistically very significant to both baseline and Placebo at 90 days.
- The demonstrated effect of Cynatine HNS is clearly superior to that demonstrated by the Placebo.

- ✓ Cynatine® HNS supports healthy hair.
- ✓ Cynatine® HNS improves the structure of hair.
- ✓ Cynatine® HNS improves the strength of hair.

▶ V. HAIR BRIGHTNESS ANALYSIS

• This data was measured by clinical evaluation by a trained clinician.

• The condition of the hair is given a numerical value based on the following scale:

- 1: Hair is dull and devoid of brightness.
- 2: Hair is basically dull and not so bright.
- 3: Hair is shiny and bright.

Table 5a. Results of the hair brightness analysis on Overall subjects

Hair brightness score	Study Group overall (male + female subjects)		
	Cynatine® HNS group	Placebo group	p-value intergroup (Cynatine® HNS vs. Placebo)
<u>Change to Baseline (%)</u> :			
Day 30	30%	8%	p<0,01
Day 60	88%	20%	p<0,001
Day 90	92%	30%	p<0,001

Intergroup determine by t-test of Student, values with p < 0.05 are significant.

Table 5b. Results of the hair brightness analysis on Female subjects

Hair brightness score	Study Group female subjects		
	Cynatine® HNS group	Placebo group	p-value intergroup (Cynatine® HNS vs. Placebo)
<u>Change to Baseline (%)</u> :			
Day 30	32%	8%	p<0,05
Day 60	88%	20%	p<0,001
Day 90	92%	28%	p<0,001

Intergroup determine by t-test of Student, values with p < 0.05 are significant.

Table 5c. Results of the hair brightness analysis on Male subjects

Hair brightness score	Study Group male subjects		
	Cynatine® HNS group	Placebo group	p-value intergroup (Cynatine® HNS vs. Placebo)
<u>Change to Baseline (%)</u> :			
Day 30	28%	8%	n.s.
Day 60	88%	20%	p<0,001
Day 90	92%	32%	p<0,001

Intergroup determine by t-test of Student, values with p < 0.05 are significant.

Figure 10a. Mean % change in hair brightness for Cynatine® HNS and Placebo – Overall subjects

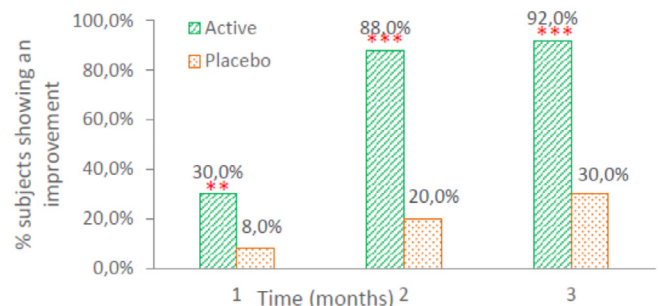


Figure 10b. Mean % change in hair brightness for Cynatine® HNS and Placebo – Female subjects

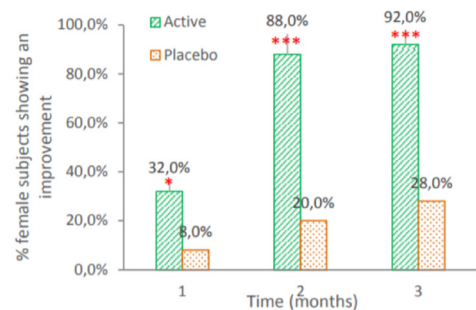
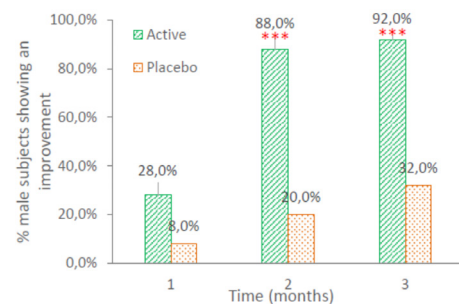


Figure 10c. Mean % change in hair brightness for Cynatine® HNS and Placebo – Male subjects



Conclusion for overall population and in female and male groups:

- Cynatine® HNS increases the shine and brightness of hair after 30 days.
- Cynatine® HNS showed results that were statistically significant to the baseline and the Placebo at 30, 60 and 90 days.

- ✓ Cynatine® HNS supports healthy hair.
- ✓ Cynatine® HNS improves the shine and brightness of hair.

▶ VI. GENERAL CONCLUSION ON HAIR STUDY

- This clinical study demonstrates the effect of Cynatine® HNS (500 mg/day) in improving hair conditions.
- The product was effective in improving hair conditions at all experimental monitored checkpoints.
- The variations obtained in the Cynatine® HNS group are statically significant from the variation obtained in the Placebo group.
- Product effects on the measured parameters were comparable between male and female subjects.
- Cynatine contributes to reduced hair loss from everyday activities.
- Cynatine is bioavailable.
- Cynatine supports healthy hair and healthy hair growth.
- Cynatine improves the structure and the strength of hair.
- Cynatine improves the shine and brightness of hair.