

Quantitative Analysis of Twenty-Two NMN Consumer Products

20-Oct-2021

Executive Summary

The twenty-two NMN brands with highest market share on Amazon were tested for potency.

- 14% had NMN content at or above the label claim.
- 23% had NMN content just below label claim, or 88-99% of label claim.
- 64% had NMN content below the method reporting limit or detection limit (indicating less than 1% of the claimed NMN was present)
- NMN was not detected in 14% of the products.

These findings are consistent with earlier analyses demonstrating that the quality of NMN-containing products (as assessed by NMN potency) varies widely, even among the top selling brands. Retailers and consumers need to be made aware of this discrepancy in order to make informed purchasing decisions.

Introduction

Nicotinamide mononucleotide (NMN), a known NAD⁺ precursor, has experienced a substantial rise in popularity as a dietary supplement over the last five years. NMN products are now widespread in the supplement market with global sales of approximately \$87 million in 2019.^{1,2,3} Due to disparities in regulatory compliance and enforcement in the industry, the quality of these products can vary greatly. In some cases, the products may not contain the amount of NMN claimed on the label. It can be challenging to discern the quality of certain products from the website or visual appearance of the product alone. A laboratory analysis is needed to confirm the potency of NMN in these products. To help understand the landscape of NMN consumer product quality, ChromaDex has tested the NMN content of twenty-two of the NMN brands with the highest market share on Amazon in mid-2021 for NMN content.

Method

Samples were analyzed by High Performance Liquid Chromatography (HPLC) using a UV-Vis detector. Prior to analyzing samples, the test method was validated for parameters including linearity, precision, accuracy, limit of detection, and limit of quantitation.

Results

One NMN product was purchased from each of the twenty-two brands with highest market share available on Amazon in mid-2021. Those twenty-two samples were received on September 8, 2021, analyzed for NMN content, and compared against the label claim listed on the product (**Table 1**). The potency of the products ranged widely. Three of the samples (14%) were found to have NMN content at or above the label claim. Five products (23%) had NMN content just below label claim, or 88-99% of label claim. The remaining fourteen samples (64%) had NMN content below the method's reporting limit or detection limit, which indicates less than 1% of the claimed NMN was present. In addition, NMN was not detected in three products (14%). To further differentiate, Komprocha NMN & Resveratrol contained a high amount of nicotinamide (> 200 mg/serving), while all others had < 1 mg/serving nicotinamide present.

Furthermore, the same distributor was listed on the product packaging from 10 of the 22 product brands. The distributor was SerumLab S&C International LLC, 5305 River Rd N STE B, Keizer, OR 97303. Packaging components, lot coding format, and label design for these samples were also similar on all ten products. In addition, the results from these products revealed NMN potency below the method reporting limit or not detected. Further, the HPLC chromatograms for these ten products were very similar and all contained a prominent unknown peak, suggesting that the formulation and contents of the ten products were equivalent and they contained an unknown substance. These products are notated with an asterisk in **Table 1**.



Table 1. Analysis Results for Select Nicotinamide Mononucleotide Commercial Products			
Code	Company and Product Name	Product Label Claim (mg NMN/serving)	Result (mg NMN/serving)
A	ChriBubble NMN*	500	ND
B	Double Wood NMN	250	243
C	EliteHealth NMN*	500	BRL
D	Energecko NMN Longevity*	500	BRL
E	ForestLeaf NMN	250	219
F	GeneX Formulations NMN	500	456
G	Infinite Age NMN	250	252
H	Jarrow Formulas NMN	125	122
I	Komprocha NMN & Resveratrol	500	ND
J	LIVEMAX NMN*	500	BRL
K	maac10 NMN 250 mg	250	260
L	monoHerb NMN	250	BRL
M	NMN MAX 500 mg NMN*	500	BRL
N	NMN PLUS 500 mg NMN*	500	BRL
O	NMN STAR 500 mg NMN*	500	BRL
P	Paragon Health NMN 500	500	ND
Q	ProHealth Longevity NMN Pro 300	300	301
R	Starhonor NMN*	500	BRL
S	Toniiq NMN	300	289
T	Vitablossom NMN Refresh*	500	BRL
U	Vitamin Shower NMN 500 mg*	500	BRL
V	VIVALIFER NMN	500	BRL
BRL – Below Reporting Limit; ND – Not Detected Reporting Limit – <1% of label claim			

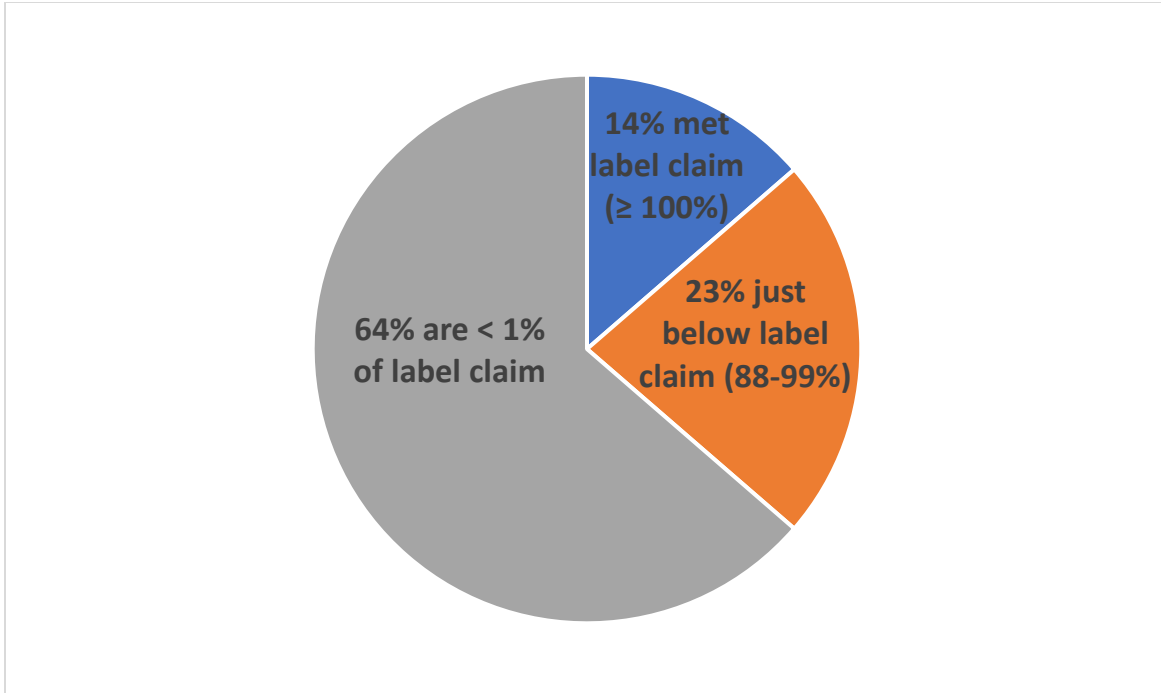


Figure 1: Results from quantitative analysis of twenty-two NMN commercial products

Conclusions

Less than 20% of the products evaluated contained the advertised amount of NMN. Conversely, approximately two thirds of the products contained <1% of the claimed amount of NMN, some of which did not contain NMN at all. While this is a limited snapshot of the vast NMN finished product landscape, it does provide a glimpse into the high variability of product quality that is available. This data should inform customers of the level of hesitancy they should feel when deciding to purchase an NMN product. According to this study, the majority of the products one might purchase online contain such a small amount of NMN that there would be no clinical benefits achieved from the dose. Another concern with these adulterated products is that the actual contents are not known and could pose a risk to the user.

References

1. AI Market Report: "Nicotinamide Mononucleotide (NMN) Market Size By Product Types (Content Below 98%, Content Above 98%), By Application Type (Health Care products, Cosmetics, Other), By End User Analysis Forecast 2021-2026" Product ID AIMR 186. Published Jan 2021.
2. MarketsandResearch.biz Report: "Global Nicotinamide Mononucleotide (NMN) Market 2020 – 2025 Research Report" Report ID 100223. Published Oct 2020.
3. ASD Reports: "Nicotinamide Mononucleotide (NMN) Market in China – Manufacturing and Consumption, Outlook and Forecast 2020-2026" Report Code ASDR-557570. Published Apr 2020.