



# What's Really in a "Collagen" Supplement?



Concerns about lack of transparency of sourcing, potential for allergic reactions, and reports of contamination have been associated with collagen supplements.



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>> Collagen dietary supplements are becoming increasingly popular, and patients may approach dermatologists for guidance and recommendations. Demand for collagen supplements is increasing at a pace disproportionate to the availability of research on their efficacy and safety. In 2019, approximately 77 percent of the US population reported using at least one type of supplement.<sup>1</sup> Collagen supplements, in particular, have seen increased growth, with the market size of the collagen industry expected to reach \$7.5 billion by 2027.<sup>2</sup>

Despite growing interest from consumers, the FDA does not maintain a list of dietary supplements or their ingredients. To document collagen supplement ingredients and identify any concerns, we surveyed locally available collagen dermatology supplements.

Our analysis of collagen supplements draws from a larger survey of dermatology supplements.<sup>3</sup> Dermatology supplements were defined as those containing the words "skin," "hair," "nails," or "glow" within the name or tagline. The Supplement Facts label and ingredient list were reviewed to identify collagen-containing supplements. We obtained a total of 59 collagen supplements from retail stores within a three-mile radius of a Houston dermatology practice.

## **LACK OF TRANSPARENCY, WIDE VARIATION IN COLLAGEN SUPPLEMENT COMPOSITION**

Where does the collagen found in these supplements come from? Does it matter in terms of efficacy or safety? We have very little data available to answer these questions. Research on collagen supplements for dermatology out-

comes is limited, and many questions remain regarding efficacy, quality, and safety. This is in part due to the fact that the collagen supplements in these studies vary significantly in terms of their source, types, and formulations.<sup>4</sup>

Our survey indicates that manufacturers also lack consensus on the "best" type of collagen in dermatology supplements, with a wide variation noted. One product used collagen from "cowhide, chicken bone broth, hydrolyzed fish collagen, and eggshell membrane collagen." Furthermore, we noted a lack of ingredient transparency among many manufacturers. More than half (30) of the supplements reviewed did not provide any information on the collagen source(s).

When listed, collagen source(s) included (in decreasing prevalence) bovine, marine, chicken, eggshell, and porcine sources (Table 1). One supplement indicated that it contained "grass-fed" collagen, while two supplements used four different sources in a single product.

The type of collagen varied as well: hydrolyzed collagen (37 percent), collagen peptides (29 percent), specific branded collagens (seven percent), and unspecified collagen types (27 percent). Formulations similarly lacked consistency. Supplements were available as powders (31 percent), tablets (22 percent), capsules (15 percent), liquids (14 percent), gummies (10 percent), soft gels (five percent), or chewables (three percent).

## **ALLERGENICITY CONCERNS**

For individuals with food allergies, inadequate ingredient disclosure increases their risk. Ten supplements (17 per-



TABLE 1. SOURCES OF COLLAGEN LISTED ON SUPPLEMENTS

| Source of Collagen         | Number of Supplements | Percentage of Supplements with Listed Sources |
|----------------------------|-----------------------|---|
| Not indicated on the label | 30                    |   |
| Bovine                     | 16                    | 43%   |
| Marine                     | 10                    | 27%   |
| Chicken                    | 7                     | 19%   |
| Eggshells                  | 2                     | 5%  |
| Porcine                    | 1                     | 3%  |
| "Grass-fed"                | 1                     | 3%  |

cent) in our sample indicated sourcing from "fish"; of these, nine lacked allergen warnings. As previously mentioned, the majority of products lacked any information at all on collagen sourcing.

Although the allergenicity of collagen powders derived from marine sources requires further research, previous reports have indicated that fish collagen is an important allergen in some patients, while hydrolyzed fish collagen has been reported to cause anaphylaxis in others.<sup>5,6</sup> Additionally, there have been cases of allergic reactions to foods containing bovine-derived and porcine-derived gelatin, a denatured form of collagen.<sup>7,8</sup>

## QUALITY CONCERNS

Similarly concerning is the overall lack of information on the processing and quality of collagen supplements. Limited evaluations have been published regarding the quality of collagen supplements. An independent investigative laboratory, ConsumerLab evaluated 15 collagen powders and found one contaminated with cadmium, a toxic heavy metal.<sup>9</sup>

Under the FDA, supplements are regulated as foods rather than drugs. Dietary supplements are thus exempt from federal pre-market review. Instead, manufacturers are responsible for determining product safety and efficacy.<sup>10</sup> Manufacturers may establish their own parameters for industry compliance with regard to the identity of ingredients, intermediary components, and final product composition. These private specifications contribute to a lack of industry uniformity, as products can possess similar labels yet differ drastically in terms of composition.

In response, patients are advised by government agencies to seek products that have undergone quality testing by independent third-party laboratories, such as the United States Pharmacopeia (USP), NSF International, or ConsumerLab. These organizations then provide seals of approval.<sup>10</sup> Unfortunately, no products in our cohort displayed these certifications.

## CAUTION AND EDUCATION

As patients continue to seek dietary supplements for skin, hair, and nail health, it is important that dermatologists caution and educate patients. Our survey identified several key concerns for patients. A major concern is the lack of ingredient transparency among collagen dermatology supplements. Almost half of products lacked information on the source of their collagen, raising concerns for allergenicity. Another concern is that of quality. Consumers should be aware that there is no such thing as FDA approval for supplements, and contamination has been reported in at least one collagen supplement. Although consumers are advised by the FDA to seek out products that have undergone testing by recognized independent investigative laboratories, none of the products we surveyed displayed these seals, further highlighting that although this is a lucrative industry, many questions and consumer concerns remain. ■

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