

# Free Acid Value (FAV)

The “free acid value” (or “bioavailable concentration”) is what is absorbed in our skin.

A **4% free acid** is usually the threshold minimum for skin renewal.

- ❖ The FAV of an AHA is responsible for cell renewal stimulation.
- ❖ For skin renewal, a lower pH and higher concentration of acid are more effective.
- ❖ Research suggests it is best for **50-75%** of the AHA to be in free acid form.
- ❖ OTC acids will usually fall in the 0-12% FAV.

AHAs can act as a moisturizer at any pH or concentration.

Less than 4.0% FAV a mild exfoliant and 4.1 to 8.0% AHA is a moderate exfoliant.

8.1 to 15% is more effective at shedding skin but can be more irritating.

## FREE ACID VALUE SKINCARE EFFECTS

12-15%

Significant increase in **collagen deposition**. Thicker, less fragmented elastic fibers.



8-12%

Significant increase in **cell turnover**. Moderate increase in **collagen deposition**.



4-8%

Moderate increase in **cell turnover**. Significant increase in **glycosaminoglycans**.



2-4%

Smoother, softer, more even skin. Moderate increase in **glycosaminoglycans\***.



0-2%

Increased **moisturization**. (Note: Acids can act as a moisture bonding humectant at any acidity).



Moving up the ladder of effects

\*Glycosaminoglycans (like Hyaluronic acid) maintain and support collagen and elastin. They also promote the ability of the collagen and elastin fibers to retain moisture.

### Glycolic Acid Example

(Numbers in Red are the Bioavailable Concentration Percent Based on pH)

pH	% Free Acid	Initial Concentration (%) of Glycolic Acid				
		4%	5%	8%	10%	15%
2.5	96%	3.8	4.8	7.6	9.6	14.3
3.0	87%	3.5	4.4	7.0	8.7	13.1
3.5	68%	2.7	3.4	5.5	6.8	10.2
3.83*	50%	2.0	2.5	4.0	5.0	7.5
4.0	40%	1.6	2.0	3.2	4.0	6.1
4.5	18%	0.7	0.9	1.4	1.8	2.6

### Lactic Acid Example

(Numbers in Red are the Bioavailable Concentration Percent Based on pH)

pH	% Free Acid	Initial Concentration (%) of Lactic Acid				
		4%	5%	8%	10%	15%
2.5	96%	3.8	4.8	7.6	9.6	14.3
3.0	87%	3.5	4.4	7.0	8.8	13.2
3.5	68%	2.8	3.5	5.6	7.0	10.4
3.86*	50%	2.0	2.5	4.0	5.0	7.5
4.0	40%	1.7	2.1	3.4	4.2	6.3
4.5	18%	0.8	0.9	1.5	1.9	2.8

Values for the tables above were calculated using the Free Acid Calculator, created by Lab Muffin.

<http://www.labmuffin.com/free-acid-calculator-for-exfoliants-at-specific-ph-levels/>



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