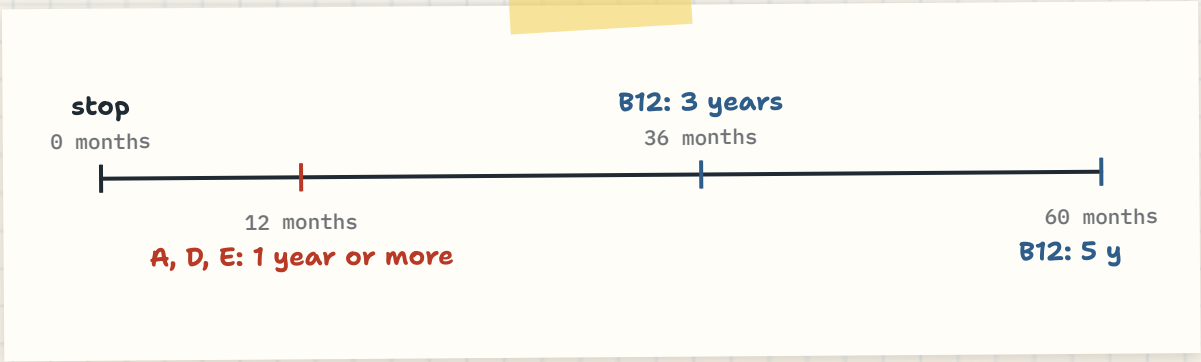
Fat- vs water-soluble vitamins

Storage, toxicity and the exceptions



Step by step

1. Fat soluble: A, D, E, K (bile, chylomicrons, lymph)
2. Water soluble: B vitamins and vitamin C
3. Stored vitamins can accumulate; urine-cleared ones flush out
4. Check the exceptions: B12, B6, niacin

Group	Stored?	Deficiency after stopping
Most water-soluble (B, C)	No; excreted in urine	Weeks to months
Vitamins A, D, E	Yes; liver and fat	A year or more
Vitamin K	Small stores	Sooner than A, D, E
Vitamin B12	Yes; liver	About 3 to 5 years

Storage and time to deficiency

Rule of thumb

Fat soluble = stored = can accumulate

Water soluble = flushed in urine

B12 is the stored exception; B6 and niacin are toxic in megadose

Exam traps

- Water soluble does not mean safe: megadoses of B6 and niacin are toxic.
- B12 is water soluble yet its liver stores last 3 to 5 years, and it appears non-toxic.
- Vitamin K has small stores, so it runs short sooner than A, D and E.

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