

The Circularity of Leather

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What is sustainable?



Renewable products (E)



Low impact (ES)

Including material efficiency (longevity)



Ethical (ESG)

Including animal welfare



Circular (E)

With realistic end-of-life solutions



Financially feasible/sustainable (SG)

Brand value

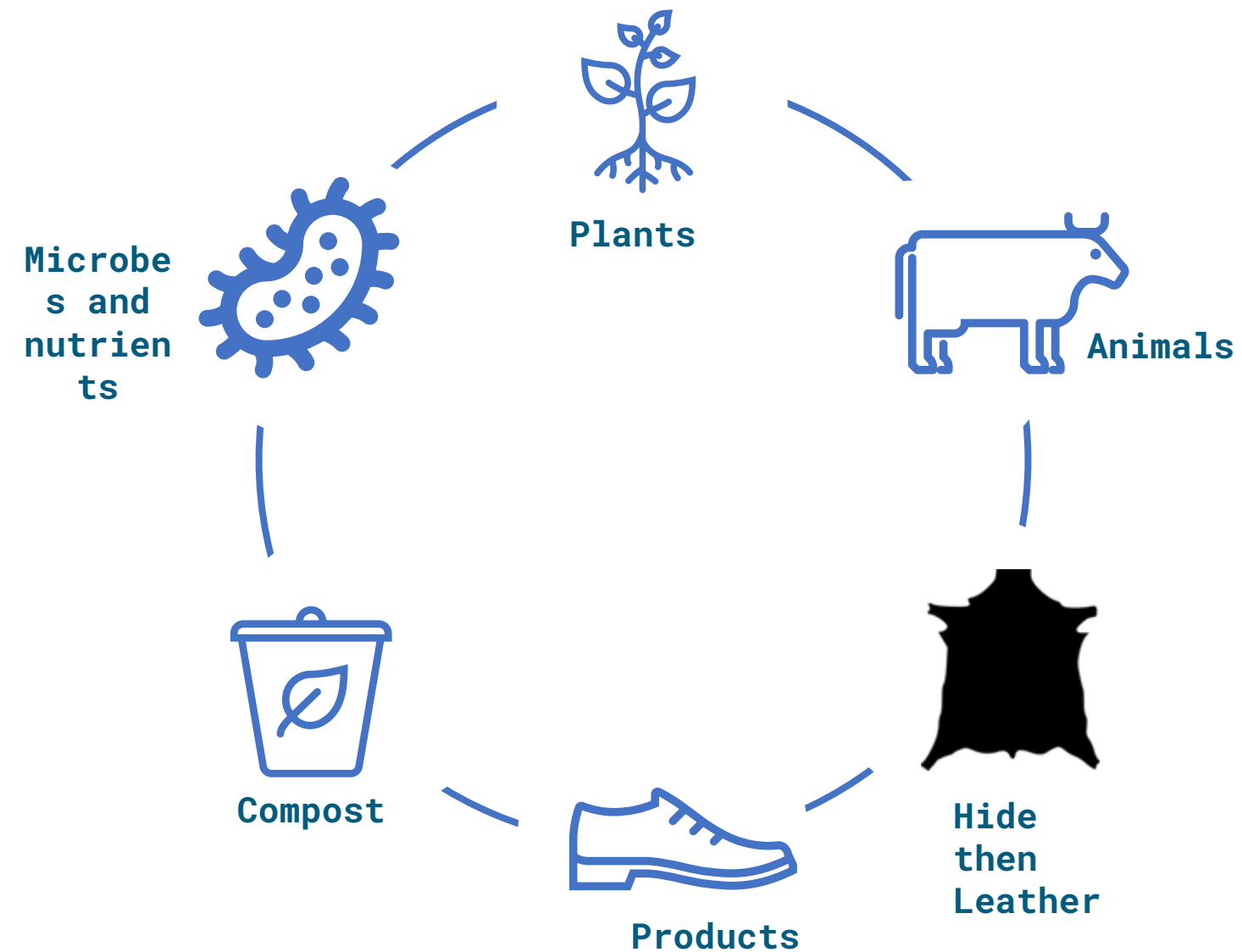
Future legislation

- Circular Action Plans (US and EU) – [EPA.gov/circular-economy](https://www.epa.gov/circular-economy)
- For the EU markets:
 - Extended Producer Responsibility – end-of-life responsibility
 - Digital product passport – must give disposal options
 - Landfill Directive – banning biodegradable waste and targets for disposal reduction
 - Increased recycled content and recyclability targets
 - Organic recycling vs mechanical vs chemical recycling
 - Biogenic is winning the material war (especially wastes)

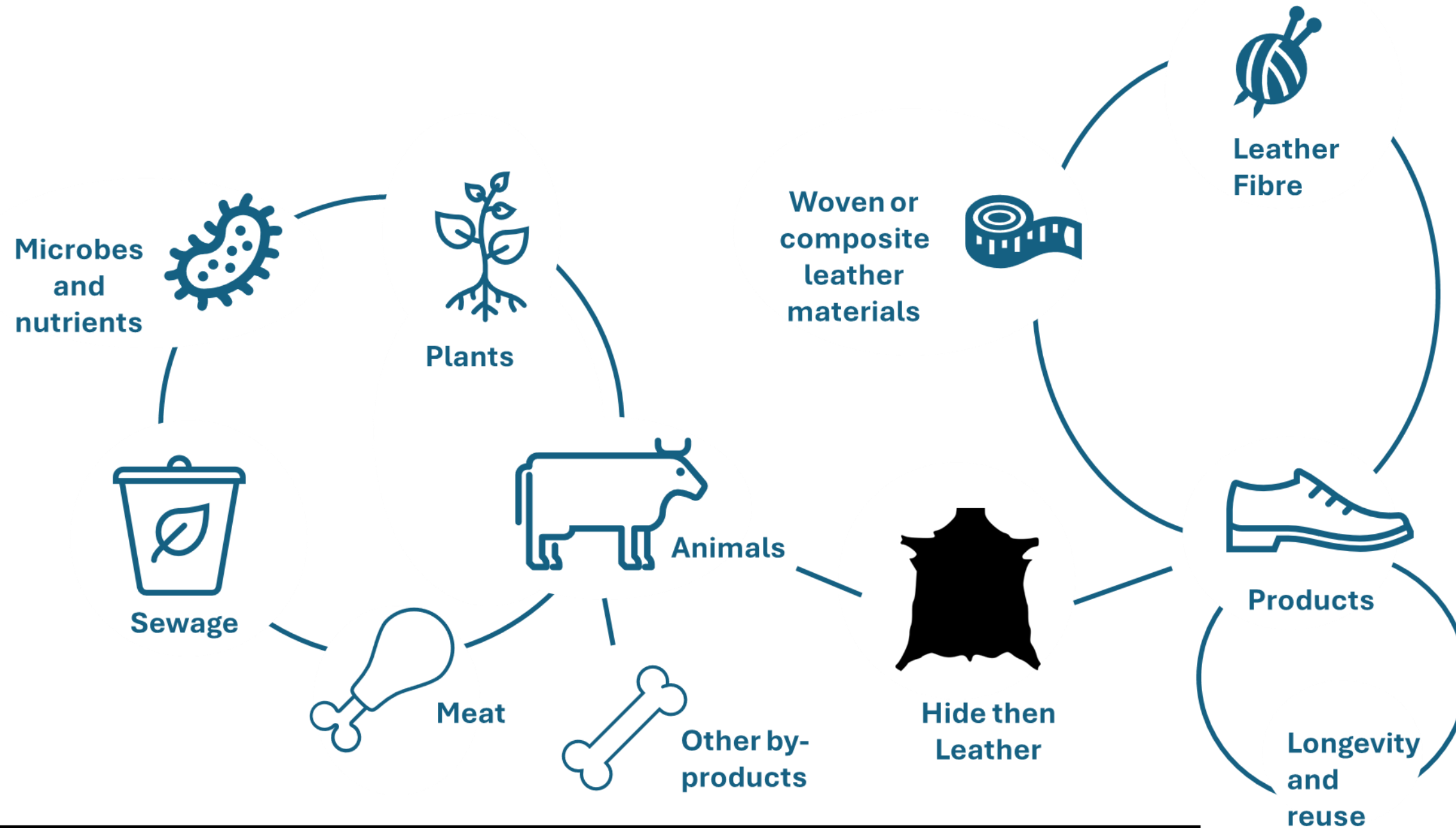
Is leather circular?

Is leather a material that is part
of the sustainable solution
given above?

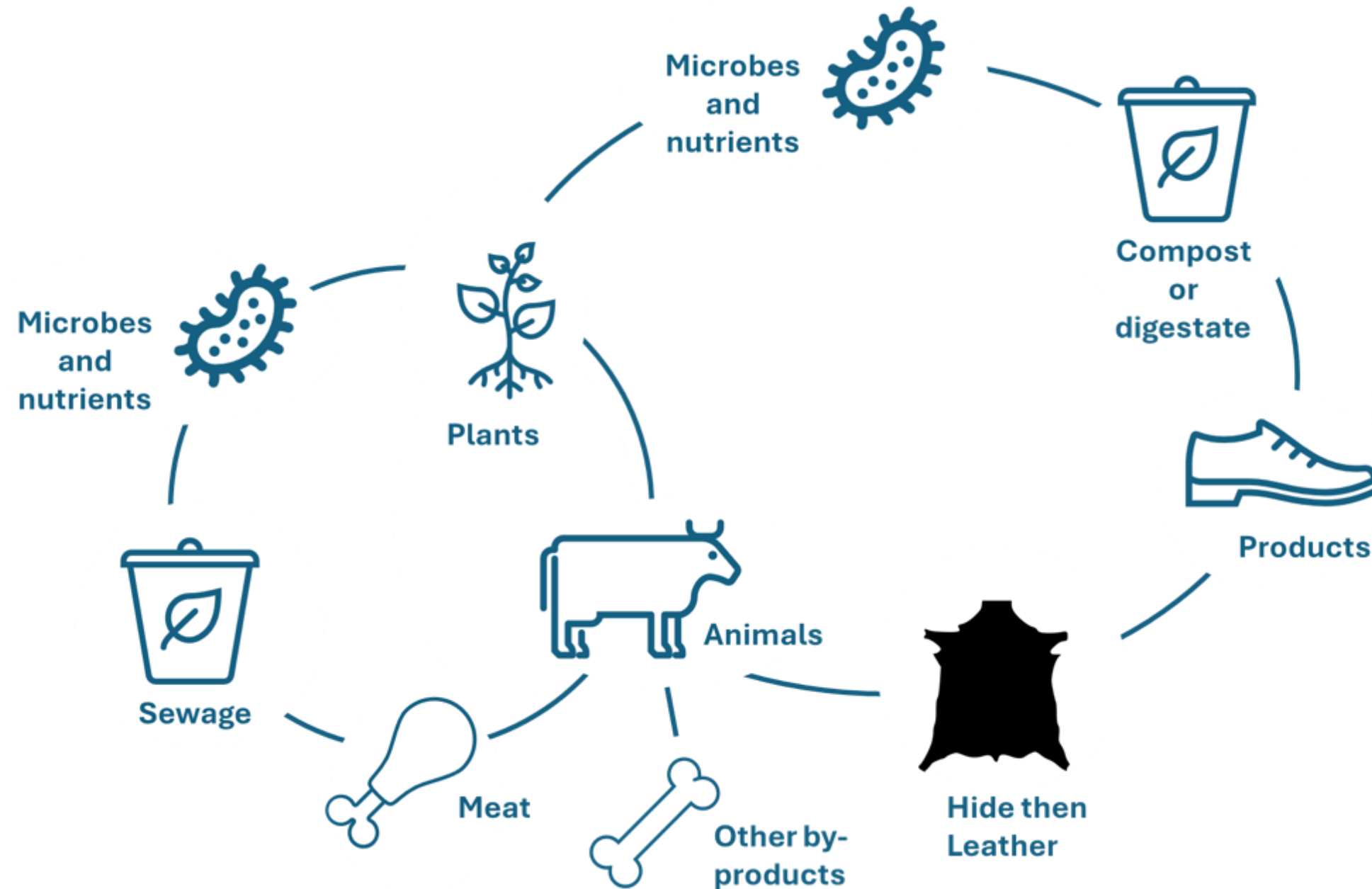
LEATHER IS NOT THIS KIND OF CIRCULAR:



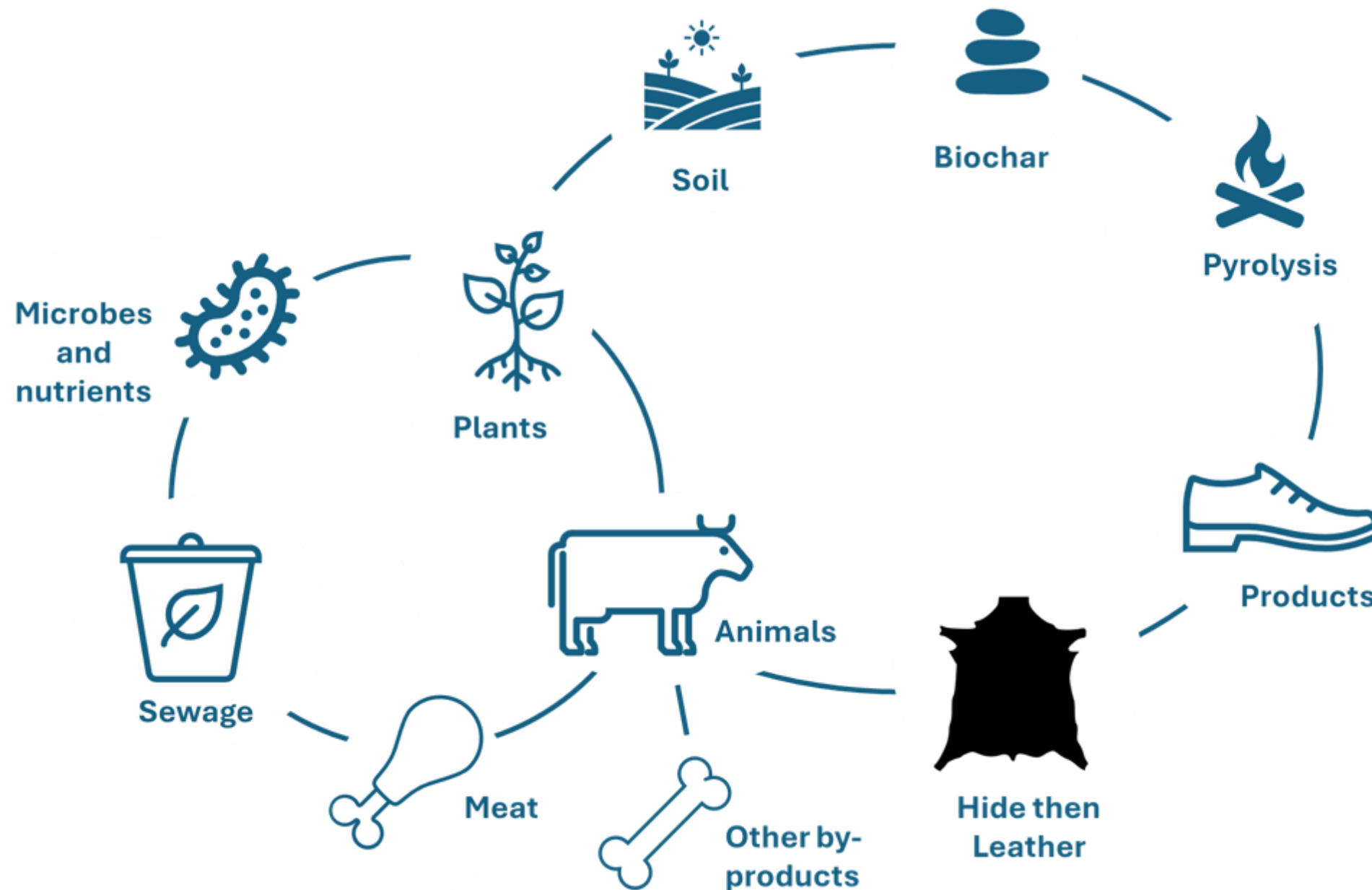
LEATHER IS THIS KIND OF CIRCULAR:



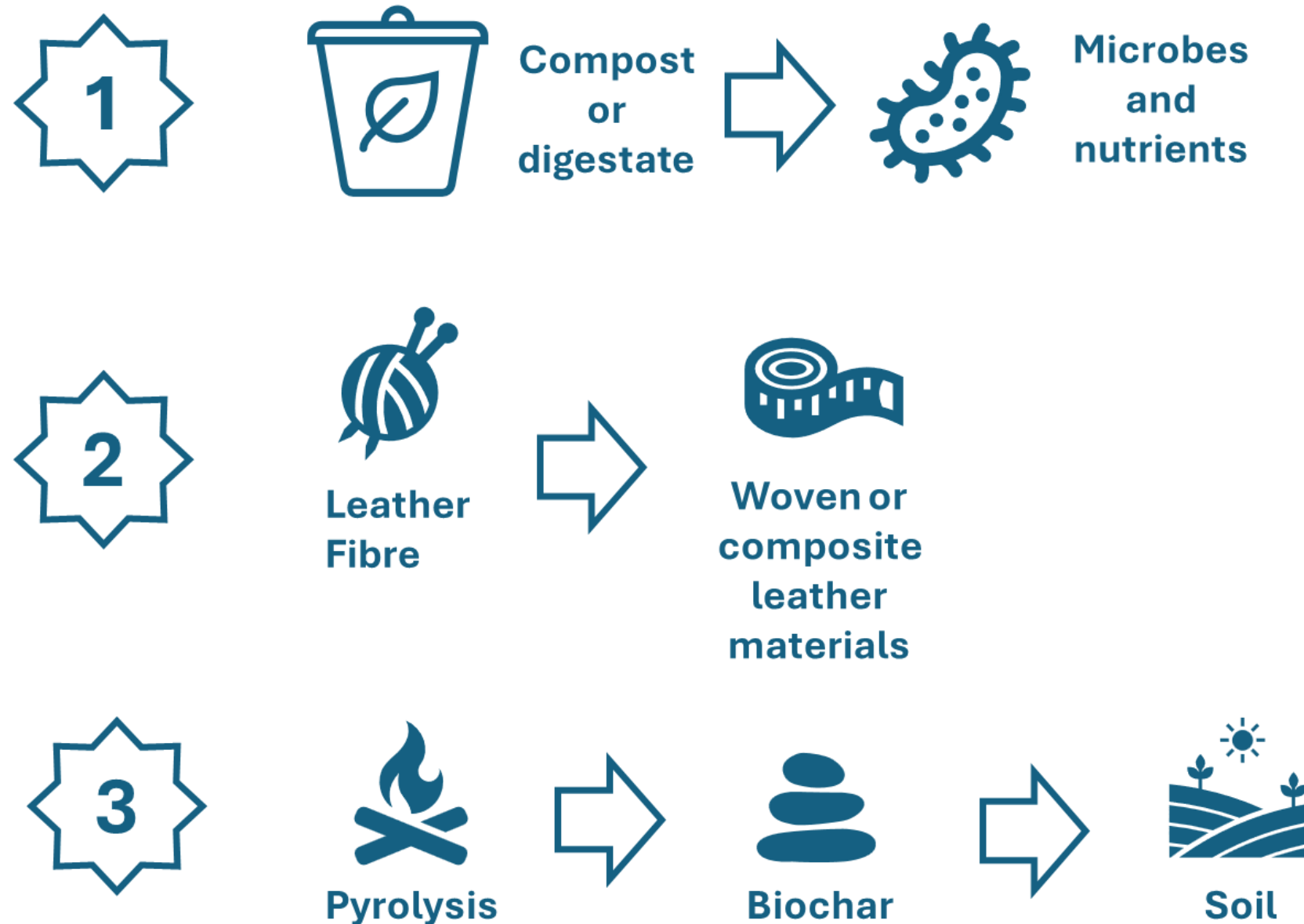
LEATHER IS ALSO THIS KIND OF CIRCULAR:



LEATHER IS ALSO THIS KIND OF CIRCULAR:



Leather products AND leather waste currently has three circular pathways:



Risk management

Risk log entries:

- Chromium – can the industry have two successful pathways
- Plastic – can we differentiate from plastic
- Soil contamination – can a bio-circular solution guarantee
- Future legislation – can current factories stop the changes proposed
 - Can the leather industry win the political case against chromium
 - The technical case is not enough.
- Are there others?

Chromium (Cr)

- The leather industry continues a long, fine record of Cr(VI) management – with continuous improvements
- Recent postponements/challenges in Proposition 65 and EU instruments on Cr(VI) limits (3 ppm to 1 ppm)
 - Not winning the political battle
 - Internal industry sabotage
- Insufficient chrome-free chemistry and cost limiting
- Chromium is difficult in circular solutions

Plastic

- Leather and plastic are distinct materials
 - Can easily be defined by biobased content (EN 16640) as largely natural fibre
- Coated and laminated leather and plastic are less biogenic and as the material is coated more the more it resembles plastic
- Many leather coatings and laminates are petroleum-based plastics and are not biodegradable
- Coatings that do not get composted can be removed and pyrolysed
- Recycling plastic (technosphere) is not proving successful
- Plastic-free leather?

Soil contamination

- Bio-circular solutions to leather are scaling and composters are learning how to compost leather and production waste
- Currently two tiers of protection:
 - Compostability (ASTM 6400 or EN 14995 or EN 13432) including metals and fluorine analysis
 - Compost certification schemes (USCC Certification Commission)
- Future two tiers:
 - End-of-life restricted substance lists (ERSL)
 - Land monitoring (ecotox screening)
- Take-back schemes and value chain co-operation

Conclusion

- Leather can be a linear life-cycle – this will diminish with legislative and societal pressure
- Three circular pathways for leather are currently being used at commercial scale:
 - Fibre recycling
 - Composting and digestion
 - Biochar (more for performance leathers and coatings)
- The industry and factories must start planning using a risk-based approach
- Can the value chain lead as a globally successful material the bio-circular route that other materials will follow?