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## Stiffness of modified collagen fibril structures manipulated by moisture content

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Flexibility and strength are both desirable characteristics in skin derived collagen materials, like leather. Dehydration of skin during production of leather transforms tissue into a stiffer material. The hydration state is a key parameter in leather production controlling the material strength and flexibility. The structural basis for flexibility in leather was investigated and the moisture content varied. Mechanical properties of collagen are known to change with moisture content. Leather produced by tanning under strain increases the leather strength through increased fibril alignment but also reduces flexibility. Small angle X-ray scattering was used to determine collagen structures and three point bend tests to measure flexibility. Results show how the interplay between moisture content and fibril alignment can be used to optimize properties in leather.

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