

The recycling of limed fleshings

The handling and any recovery of products contained in limed fleshings in the tannery has long been a serious expense. Moving this material for eventual dumping incurs labour costs, even when the specialised equipment developed for the purpose is employed. Another factor against dumping is the restrictions in force, with more coming into force, regarding the disposal of organic materials. Although various systems of recovering fat in the form of tallow and the protein contained in the resulting sludge have been adopted most of them require prodigious amounts of energy for their operation, making the process, at best, marginally economic. The entry, however, of the German Flottweg company, specialists in separation technology, into the field has rationalised the process offering a significant contribution toward equipment investment and operation costs.

The Flottweg approach

Together with a German tannery the company developed a system to separate the three different components of the limed fleshings for further application and treatment. The primary objective in this process is the separation of the components:

Tallow: about 7-15%
Solids: (mainly proteins), about 8-15%
Water: 75-85%.

In the first—and the most useful—phase tallow is separated out. Tallow can be used as a fuel to produce heat. Next is the solids phase, rich in proteins, nitrogen and calcium suitable for composting. The third phase is the removal of excess water which can then be treated in the customary wastewater treatment facilities.

Flottweg's fleshings treatment equipment has a track record going back over 14 years. Low investment, minimised operational costs and effective processing combine to produce optimum results according to the company.

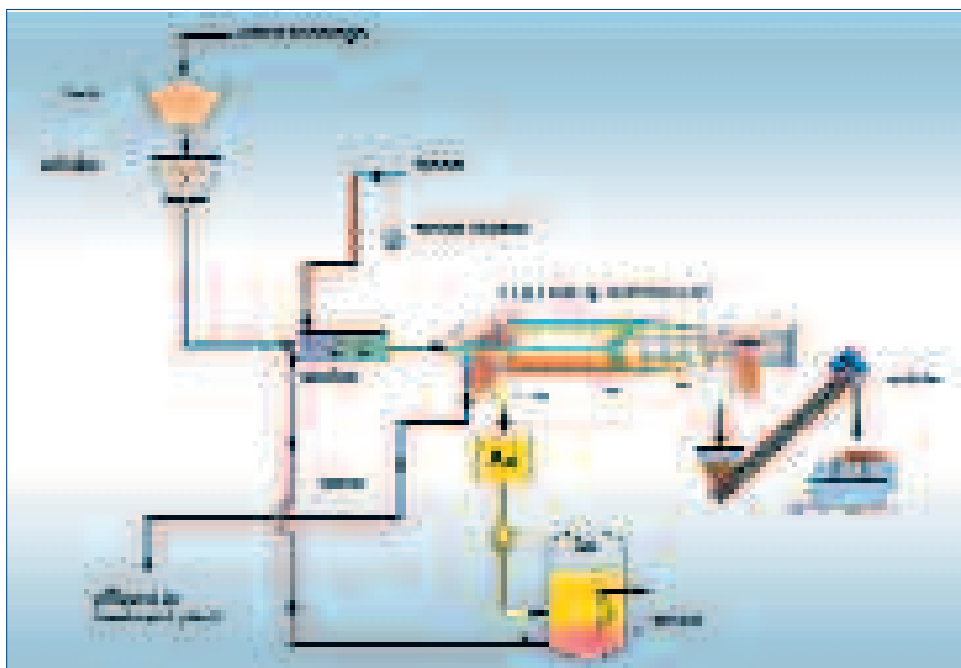
The equipment and the process

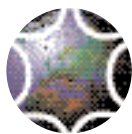
The fleshings are pumped to a large mincer or grinder where their particle size is reduced to about 10mm and are then conveyed to a continuous cooker for thermal treatment. At 78-85°C the minced fleshings are melted by applying direct and indirect heat for about two to three minutes. This short thermal treatment avoids destruction of the solids phase and provides for an optimum release of tallow from the cells. The melted fleshings are then discharged from the continuous cooker and passed into a homogenising tank from where they are pumped to the heart of the process, the 'Flottweg Tricanter'. This machine is a three-way centrifuge which separates the three main components—namely tallow, water and solids—continuously by centrifugal force. Special devices on the Tricanter allow the operator to optimise separation manually or automatically, according to raw material input.

Following the separation in the Tricanter the solids discharge contains 57-65% moisture. To avoid hydrolysis of the proteins the solids are cooled. The water phase comprises 0.5-0.9% tallow and some soluble solids which are sent to the wastewater treatment plant. The aqueous phase has a fairly high BOD/COD.

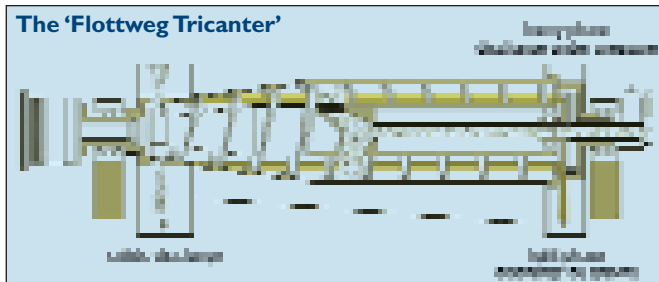
The recovered tallow is discharged to a holding tank where static sedimentation takes place, quickly settling fines and water. The clean tallow from the top of the tank is pumped into the storage tank and the bottom layer is continuously fed back to the processing plant. The recovered tallow consists of 99.3% tallow, 0.4-0.6% water and 0.1-0.2% impurities.

Processing limed fleshings





The 'Flottweg Tricanter'



Plant viability

The composition of the raw material determines the viability of the operation of this type of plant. Using the recovered tallow as a fuel for steam generation, dramatic fuel cost savings can be achieved. Proteins recovered can be utilised as fertilisers eliminating or reducing disposal costs. Water goes to the normal wastewater treatment facilities. Economic plant size starts at a capacity of 3 tons/hour. The capacity range offered by Flottweg is between 2.5 tons and 9 tons per hour. One operator per shift is required to run the equipment, which needs only a limited amount of space. Individual units of the equipment are available for integration with existing systems.

Wastewater sludge dewatering

Flottweg centrifuges are also used in effluent treatment. There

Corporate profile

Based upon many years of experience and intensive research into the technology of solids and liquids separation Flottweg is amongst the most successful manufacturers of a full range of centrifuges and belt presses.

The foundation of the present day business goes back to 1932 when Dr Georg Bruckmayer acquired a motor engineering company which in time became Flottweg GmbH now situated in Vilsbiburg in Bavaria. Thousands of centrifuges and belt presses have since been sold worldwide and are in service in the food processing and chemicals industries as well as in environmental management. ISO 9001 certification was attained in 1994. Its own sales and service establishments are located in most important industrial countries and the rest of the world is covered by appointed companies. In 2002 a turnover of €60 million was generated with 360 employees. Export performance is at 75% of production.

are many installations in service in tanneries for sludge dewatering. Different decanter sizes with capacities from 1-150 m³/hr are available to dewater primary, biological, mixed and chrome sludges with optimum results. 