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典型海产小杂鱼机械去脏试验

Experiment of mechanized gutting for typical small marine fish

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中文摘要:

针对海产小杂鱼前处理设备短缺现状,开展小杂鱼机械去脏试验研究。利用去脏加工试验平台,选取深水红娘鱼(*Lepidotrigla abyssalis*)、叉斑狗母鱼(*Synodus macrops*)和小黄鱼(*Pseudosciaena polyactis*)作为小杂鱼典型代表,分别进行2种剖腹去脏布置方式、2种剖腹刀具构型、4种除脏轮构型以及剖腹刀具和除脏轮的转速转向变化、夹带线速度与其不同的匹配组合对去脏效果和感官质量的比较试验。结果表明:上述3种小杂鱼以剖腹去脏装置下置式并匹配以高转速无齿圆盘刀逆向剖腹和低转速仿形异构齿除脏轮逆向去脏加工方法比较合适;平肚型类的深水红娘鱼和侧扁型类的小黄鱼还可采用适当构型的三角形齿或梯形齿除脏轮进行逆向去脏加工方法;机械方法的生产率是手工方法的8~12倍,能够实现某些小杂鱼品种的鱼内脏100%除净率和近似零损伤鱼体的质量效果。海产小杂鱼机械去脏加工技术路线可以设计为:去头后的小杂鱼-定向与有序喂料-夹带定位与输送-圆盘刀旋切鱼腹-夹带定位与输送-鱼腹张开-除脏轮去除鱼内脏-夹带定位与输送-去脏后的鱼体输出漂洗。该研究可为小杂鱼机械去头去脏加工设备的设计提供参考。

英文摘要:

Abstract: An experimental study on mechanized gutting for small marine fish was conducted, faced with equipment shortages for the pre-processing of small marine fish. The test platform of fish gutting was established. Abyssal searobin (*Lepidotrigla abyssalis*), crossbarred lizardfish (*Synodus macrops*), and little yellow croaker (*Pseudosciaena polyactis*) were selected as the typical representative fish. The following experiments were conducted for comparing the gutting effects and sensory quality of processed small marine fish: the two types of arrangement patterns for fish belly cutting and gutting, two types of cutting disc configuration, four types of gutting wheel structure configuration, and the rotation direction and rotation speed changes of the cutting disc and gutting wheel, and their various matching combinations with the linear velocity of the pinch belt. The test results showed that the lower setting type cutting and gutting devices combined with the converse cutting of a high rotating toothless disc knife and converse gutting of low rotating form-copying special-shaped toothed gutting wheel are suitable to all the three typical small marine fish. A triangular profile toothed gutting wheel or Trapezoidal profile toothed gutting wheel combined with a converse gutting processing method are also suitable for flat belly fish such as Abyssal searobin (*Lepidotrigla abyssalis*) and the fish which have a laterally compressed body such as little yellow croaker (*Pseudosciaena polyactis*). The productivity of a mechanized processing method is as 8-12 times as much as the productivity of a manual processing method. The 100% gut removal rate and the quality effect of almost zero fish body damage can be achieved for some small species. The processing order of mechanized gutting for small marine fish is: head cutting-orienting and orderly feeding-pinch belt positioning and conveying-disc knife rotary cutting fish belly-pinch belt positioning and conveying-opening fish belly-gutting wheel scrapings off fish viscera-pinch belt positioning and conveying-and gutted fish conveyed to washing. In general, the above mentioned species of small marine fish are landed together, and their size and body characteristics are greatly different, so their pre-processing is difficult and needs a heavy workload. However, the manual gutting processing replaced by the mechanical gutting processing can be achieved through proper size grading and species sorting, and the development of a general small-scale fish gutting device. This research can provide the guidance for the design of mechanized cutting and gutting equipment for small marine fish.

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