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**SWIVEL CONNECTED GANGIONS IN MECHANIZED LONGLINING -
EFFECT ON CATCH RATES AND OPERATION**

by

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ABSTRACT

Multifilament longline with swivel connection between gangions and mainline were compared with traditionally rigged gear on a vessel equipped with a mechanized longline system. The swivel-lines were adapted to the mechanized system without difficulties. The effect of the swivels was clearly positive, both regarding catch rate (+15%) and easier handling of the gear.

1. INTRODUCTION

In monofilament longlining, swivels are commonly used for connecting the gangions to the mainline. This rigging method has until recently had little application in longlining with multifilament gear. Compared with traditionally rigged gear, where the gangions are fixed to the mainline by knotting, earlier experiments have shown that the swivel connection improves the catch rates by 10% or more and also simplifies the handling of the gear. (Bjordal, 1985 A and B).

Based on these results the use of this multifilament swivel-line (type: Mustad Quick Snap) has gradually increased in Norwegian longlining, but until recently its use has been

restricted to longline operation based on handbaiting.

Last fall (1986) the first systematic trials with the Quick Snap line were conducted on a vessel equipped with a mechanized longline system (Autoline). This report shortly describes the results from these trials, based on data recorded by - and personal communication with the skipper P. Holmeset of the longliner M/V "Geir".

2. GEAR, EQUIPMENT AND EXPERIMENTAL DESIGN

The principle of the Quick Snap line is shown in Figure 1. To adapt the Autoline system to this new type of gear, two modifications were made: a) change the profile of the horizontal hauling shieve to prevent jamming of the swivels; and b) minor adjustments of the hook separator unit.

The swivel represents the main difference between the two types of gear, that otherwise were rigged with similar hook spacing (1.40 m), similar gangions (terylene multifilament, 2.0 mm diam., length 0.5 m), similar hooks (Mustad Kirby Sea, Qual. 2330 B, No. 6 kirbed) and the same type of bait.

The gear was operated as bottom set longline in fleets of 4200 hooks each. Total catch pr fleet of Quick Snap and traditional gear were recorded for two longline trips off N Norway. During the first trip (Røstbanken, Oct. 1st - Nov. 5th) the operation was based on one fleet of Quick Snap gear and 5 fleets of traditional gear, while on the second trip (Nordkappbanken, Nov. 17th - Dec. 18th) the amount of Quick Snap gear was increased to two fleets out of six.

3. RESULTS

The main target species during the first trip was tusk (Brosme brosmes), while cod (Gadus morhua) and haddock (Malanogrammus aeglefinus) were the dominant species on the

second trip. The effort- and catch data are given in Table 1.

As seen from the table, catch rates of the Quick Snap line was superior to the traditional line during both trips, with an increased catch rate of 15,5 % for the first trip and 15,4% for the second trip.

However, the relative difference in catch rate between the two types of gear showed a daily variation from nil to 50%. Largest relative difference in catch rate was normally obtained during bad weather- and current conditions.

After initial adjustments of the Autoline systems, there was no specific problems of operating and handling the new type of gear. The main manual effort in the gear handling process is the maintainance work, especially the replacement of broken gangions and damaged hooks. Normally most of the gangions that are twisted around the mainline will be detwisted automatically, but the system still leaves a certain amount of gangions to be detwisted by hand. This operation is much simpler to do on the swivel line, and according to the skipper the maintainance personell might be reduced from normally 3 to 2 crewmembers when operating the swivel longline.

4. DISCUSSION

These full scale trials confirms the results from earlier investigations (Bjordal 1985, A and B), when the swivel effect was found to improve the catch rates of multifilament longline gear by 10-15%. Excluding the effect of the bait, improved catch rates on longline gear might be obtained by increased hooking probability and/or reduced rate of escapement. Since there is no strong reason to believe that the swivels will increase the hooking probability it must be assumed that the positive effect of the swivels mainly is due to reduced escapement of fish during hauling of the gear. When gangions are twisted, either around the mainline or around its own axis and on to the hook, the flexibility of

the gangion is highly reduced. This will increase the possibility of escapement, especially under bad weather conditions when jerking movements of the line are created by the rolling and pitching of the vessel. This theory is supported by the observation that the positive effect of swivels is most predominant during bad weather conditions.

REFERENCES

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Table 1. Comparison between Quick Snap (swivel) and traditionally rigged longline. Effort and catch data.

TYPE OF GEAR	EFFORT		TOTAL CATCH (KGS)	AVERAGE CATCH RATES (KGS)	
	#FLEETS	#HOOKS		PR FLEET	PR 100 HOOKS
TRIP 1					
QUICK SNAP	31	130.200	17.400	561.3	13.4
TRADITIONAL	173	726.600	84.300	487.3	11.6
TRIP 2					
QUICK SNAP	59	247.800	61.300	1039.0	24.7
TRADITIONAL	101	424.200	90.900	900.0	21.4



Figur 1. Quick Snap line, with swivel that allows rotation around the axis of the gangion and rotation around the mainline.